



Marine Stewardship Council fisheries assessments

# Western Australia enhanced greenlip abalone fishery

## Public Comment Draft Report

Conformity Assessment Body (CAB)	bio.inspecta (mandated by q.inspecta)
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Fishery client	Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited)
Assessment type	Initial Assessment
Date	11 April 2022

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## 2 Glossary

Acronym	Term
ACDR	Announcement Comment Draft Report
AMF	Abalone Managed Fishery
ARMA	Aquatic Resource Management Act
AVG	Abalone viral ganglioneuritis
CEO	Chief Executive Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPUE	Catch per unit Effort
CWCE	Central West Coast
DBCA	Department of Biodiversity, Conservation and Attractions
DDG	Deputy Director General
DoF	Department of Fisheries
DoT	Department of Transport
DPIRD	Department of Primary Industries and Regional Development
EBFM	Ecosystem Based Fisheries Management
EPBC	Environment Protection and Biodiversity Conservation
ERA	Environmental Risk Assessment
FIS	Fishery Independent Surveys
FRMA	Fish Resources Management Act
FRMR	Fish Resources Management Regulations
GBS	Genotyping by Sequencing
GLM	Generalized Linear Model
HAC	Hatch and catch
HCR	Harvest control rules
HS	Harvest Strategy
LNE	Leeuwin-Naturaliste
LRP	Limit Reference Point
MCS	Monitoring and compliance system
MEMP	Management and Environmental Monitoring Plan (produced by OGA/RFAF)
MPAs	Marine Protected Areas
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
t and mt	Ton and metric ton
nm	Nautical mile
OCP	Operational Compliance Plan
OCS	Offshore Constitutional Settlement
OGA	Ocean Grown Abalone
PI	Performance Indicator

PRI	point where recruitment would be impaired
R & D	Research and Development
RFA	Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited)
RP	Reference Point
SAT	State Administrative Tribunal
sCPUE	Standardised CPUE
SHL	Sustainable harvest level
SLAs	Service Level Agreements
SLSWA	Surf Lifesaving Society of WA
SNPs	Single-nucleotide polymorphisms
SoM	Size of Maturity
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TARC	Total Allowable Recreational Catch
TN	Total nitrogen
TP	Total phosphorous
TRP	Target Reference Point
UoA	Unit of Assessment
UoC	Unit of Certification
VMEs	Vulnerable Marine Ecosystems
VR	Variation request
WA	Western Australia
WCADA	West Coast Abalone Divers Association
WAEGAF	Western Australian enhanced greenlip abalone fishery
WAFIC	Western Australian Fishing Industry Council

### 3 Executive summary

This report is the Public Comment Draft report (PCDR) which outlines the MSC assessment process for the Western Australia enhanced greenlip abalone fishery (WAEGAF). The assessment team consists of Dr Sabine Daume (Team Leader and Principle 2), Dr Klaas Hartmann (Principle 1) and Sascha Brand-Gardner (Principle 3).

No stakeholder comments were received during the consultation period and a modified assessment tree was confirmed and used, which consisted of the default assessment tree with the addition of specific genetics and translocation PIs (Genetic Outcome, PI 1.1.3; Genetics Management, PI 1.2.5; Genetics Information, PI 1.2.6; Translocation Outcome, PI 2.6.1; Translocation Management, PI 2.6.2; Translocation Information, PI 2.6.3) as well as rewording of PIs to include the enhancement activity (2.4.1-2.4.3 and 2.5.1-2.5.3, 3.1.3 and 3.2.1-3.2.4). A variation request (VR) was submitted to the MSC to justify the changes on the 5<sup>th</sup> of July 2021 and before the work on the assessment started. The MSC approved the VR on the 16<sup>th</sup> of July 2021.

The stock described in the UoA is the same as the greenlip abalone stock assessed under the MSC standard and certified as part of the Western Australia abalone fishery. As such as per FCP 7.7.2 the relevant components of the assessment have been harmonized and the same assessment tree used (FCP PB1.3.3.1.c). It should be noted that whilst the same stock is impacted by both UoAs, the fishing activities

do not overlap. In Principle 1, full harmonization with the greenlip abalone UoA of the Western Australia abalone fishery was achieved with the 2022 re-assessment report (Peer Review and Client Review Draft Report Stage) for that fishery.

bio.inspecta confirms that this fishery is “within scope” and eligible for MSC certification. The MSC Fisheries Certification Process version 2.2 is being used for this assessment. The risk-based framework (RBF) was not used for the assessment of this fishery.

### **Fishery strengths**

- Well-developed harvest strategy and harvest control rule for the broader stock
- Ability to clearly control harvest of the WAEGAF population
- Defined area of impact and small footprint due to spatial regulation (lease area)
- No feeding or nutrient input
- Health testing of animals before release and health monitoring throughout
- Solid overarching regulatory framework

### **Fishery weaknesses**

- Lack of clear understanding of the interaction with the broader population and the potential impact of the WAEGAF population – both genetically and on recruitment
- Lack of records on predator removal (rock lobster and octopus)
- Lack of knowledge on the wider impact of the ecosystem (through risk assessment or otherwise)
- No fishery-specific short-term objectives.
- Monitoring and evaluation of key parts of the management system appears ad hoc
- Operators are not providing all of the required information and apart from commercial reporting requirements, information on the fishery is very limited.
- The broodstock strategy is not well defined and monitored

The site visit took place on the 29<sup>th</sup> – 30<sup>th</sup> November 2021 when additional information was reviewed, and the views of stakeholders were requested. Additional documents were received with permission from stakeholders after the onsite meeting.

On completion of the site visit and scoring, no Performance Indicators (PIs) scored less than the Scoring Guidepost (SG) of 60, 11 PIs scored between SG 60 and 80 and the average scores for the three Principles remained at or above SG80.

The team has included 10 conditions (two for Principle 1, four for Principle 2 and four for Principle 3). Genetic management of PI 1.2.5 (genetic broodstock strategy) and primary species information (predator removal) of PI 2.1.3 will also each have a non-binding recommendation. Overall, the assessment team recommends that the fishery is certified.

## 4 Report details

### 4.1 Authorship and peer review details

Peer reviewer information to be completed at Public Comment Draft Report stage

Together the team meets all competency requirements laid out in FCP v2.2 Section(s) 7.6, 7.14, Annex PC Table PC3 and it was confirmed that there are no conflicts of interest.

#### **Team Leader and Principle 2 Expert:** Dr Sabine Daume

Dr Daume is the Managing Director of bio.inspecta Pty Ltd, Centre for Seafood Certification based in Melbourne, Australia which covers MSC, ASC and Fisheries Improvement programs. Since 2009, Dr Daume has led numerous MSC evaluation audits including several large and controversial assessments, and many assessments in Australia.

Dr Daume led the WA rock lobster and Heard Island and McDonald Islands (HIMI) icefish annual surveillance and re-assessments as well as the HIMI and Macquarie Island toothfish full assessment in Australia, and numerous audits in the USA, Canada, Mexico and Japan. Dr. Daume led five full assessments in Western Australia between 2015 and 2018 (Peel Harvey Estuarine Fishery, West Coast Deep Sea Crab Fishery, Australian Silver-lipped Pearl Fishery, Western Australian Abalone Fishery, Western Australian Octopus Fishery). She has been trained by the MSC to use the Risk Based Framework (RBF) and the most recent MSC Certification Requirements (v2.0 Oct. 2015). She is a certified lead auditor under the ISO 9001:2008 standard.

Dr Daume has expertise in the biology and ecology of exploited marine resources. Dr Daume has over 25 years' experience working with the fishing and aquaculture industry in Australia and worked as a Senior Research Scientist at the Research Division of the Department of Fisheries in Western Australia.

#### **Team Member and Principle 1 Expert:** Dr Klaas Hartmann

Dr Hartmann is a Senior Research Fellow and Mathematician at the Institute for Marine and Antarctic Studies (IMAS) University of Tasmania whose research involves bio-economic modelling across a broad range of fisheries. Throughout his career he has worked on resource and conservation management from a mathematical ecology and ecological economics perspective. After working in fisheries at CSIRO for two years, Klaas focused on prioritising resources for biodiversity conservation, particularly using phylogenetic information.

Since commencing work at IMAS in 2009, Klaas has returned to his initial interest in fisheries modelling. At IMAS Dr Hartmann works on bio-economic models and developing/evaluating novel management strategies in collaboration with fisheries managers and industry. This work has helped support large changes in several fisheries that have substantially increased their profitability whilst improving environmental outcomes. Klaas has been responsible for conducting or overseeing Southern Rock Lobster and Giant Crab assessments in Tasmania for over ten years and Victoria for five years. Klaas was responsible for producing the Tasmanian Scalefish assessment for three years and has overseen and/or advised the assessment process for a further five years. Klaas is a committee member of the Tasmanian Crustacean Fisheries Advisory Committee and the Status of Key Australian Fish Stocks Advisory Committee. Dr Hartmann has been the P1 expert on several confidential pre-assessments and the recent annual surveillance audits of WA fisheries including the Peel Harvey Estuarine Fishery.

#### **Team Member and Principle 3 Expert:** Sascha Brand-Gardner

Ms. Brand-Gardner is the MSC Fisheries Program Manager and a Lead Auditor at bio.inspecta and has over 20 years of experience working in fisheries policy, ecosystem-based fishery management and marine research. She was a senior fishery manager at the Department of Primary Industries and Regional Development - Fisheries Division in Western Australia (WA) and managed several prawn and scallop trawl and large pelagic line fisheries as well as multi-species ornamental fisheries. Prior to this, she worked on several marine research projects related to endangered, threatened and protected species, fishery habitats, abalone and the environmental impacts of aquaculture.

Sascha has an Honours degree in Marine Zoology (The University of Queensland) and has been trained to use the most recent MSC standard and certification process and is a certified lead auditor under the ISO 9001:2015 standard. Sascha has been the Team Leader and Principle 3 expert for the MSC assessments of two Australian blue grenadier fisheries, the Lakes and Coorong pipi fishery and Bass Strait scallop fishery and Principle 3 expert for the AFMA managed Heard and McDonald Islands and Macquarie Island toothfish re-assessments in 2016 and the Eastern Tuna and Billfish Fishery in 2020. Sascha has also been the Team Leader for the WA abalone fishery surveillance audit and has been involved in many pre-assessments of various species and gear types.

The peer review was conducted by Dr Jeff Kinch and Dr Terry Holt. For further information please see details on the fisheries MSC assessment page ([here](#)).

## 4.2 Version details

Table 1– Fisheries program documents versions	
Document	Version number
MSC Fisheries Certification Process	<b>Version 2.2</b>
MSC Fisheries Standard	<b>Version 2.01</b>
MSC General Certification Requirements	<b>Version 2.4.1</b>
MSC Reporting Template	<b>Version 1.2</b>

## 5 Unit(s) of Assessment and Unit(s) of Certification and results overview

### 5.1 Unit(s) of Assessment and Unit(s) of Certification

#### 5.1.1 Unit(s) of Assessment

bio.inspecta confirms that this fishery is “within scope” and eligible for MSC certification (FCP v2.2 7.4) as it:

- Does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices or target amphibians, reptiles, birds or mammals.
- Does not include an entity that has been convicted for a forced or child labour violation in the last 2 years.
- Does not engage in shark finning and is not based on an introduced species.
- Has a mechanism for resolving disputes and is not overwhelmed by disputes.
- It is an enhanced fishery, therefore see details under 5.1.3.

**Table 2 – Unit of Assessment (UoA)**

UoA 1	Description
Species	Greenlip abalone ( <i>Haliotis laevis</i> )
Stock	South coast of Western Australia
Fishing gear type(s) and, if relevant, vessel type(s)	Hand collection
Client group	Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited)
Other eligible fishers	None
Geographical area	Flinders Bay, South coast of Western Australia

### 5.1.2 Unit(s) of Certification

**Table 3 – Unit of Certification (UoC)**

UoC 1	Description
Species	Greenlip abalone ( <i>Haliotis laevis</i> )
Stock	South coast of Western Australia
Fishing gear type(s) and, if relevant, vessel type(s)	Hand collection
Client group	Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited)
Other eligible fishers	None
Geographical area	Flinders Bay, South Coast of Western Australia

### 5.1.3 Scope of assessment in relation to enhanced fisheries

It is bio.inspecta’s view that the MSC scoping criteria for an enhanced fishery are met. The operation is a “hatch and catch” fishery under the definition of the MSC certification process version 2.2 and MSC standard version 2.01.

The operation is a “hatch and catch” fishery under the definition of the MSC standard “production systems that involve the introduction of fish either as eggs, larvae or juvenile and subsequent recapture” (MSC-MSCI Vocabulary v1.2).

**Hatch and catch (HAC):** This production system may be considered within scope in certain circumstances, reflecting the established case history and precedent set by the hatchery-stocked salmon

fisheries. For these types of fisheries, more intensive culture activities may be allowed if they only apply to a brief period within the species' life cycle. Linkages to wild stocks may exist in HAC systems where marine species are raised to a larval or juvenile stage in captivity and then released into and harvested from a wild stock.

**Scope criteria A: Linkages to and maintenance of a wild stock**

*i At some point in the production process, the system relies upon the capture of fish from the wild environment.*

Greenlip abalone (*Haliotis laevigata*) broodstock have been taken from the wild originally to be spawned at the 888 Abalone hatchery in Bremer Bay, Western Australia. The last full cohort of wild broodstock derived juveniles were delivered to Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited) in 2014. Since then, a smaller proportion of the cohorts (70% and 12% for 2015 and 2016 respectively) were spawned from wild broodstock. The more recent cohorts of juvenile abalone (2017 and 2018) were derived from farm grown stock (F1). The ocean grown stock of abalone are harvested from the wild environment when they reach approximately 100 mm in shell length.

*ii The species is native to the geographic region of the fishery and the natural production areas from which the fishery's catch originates.*

*Haliotis laevigata* Donovan, 1808 is endemic to Australia and occurs predominantly along the Southern Australian coastline off Victoria, South Australia, Western Australia and the north coast of Tasmania. Greenlip abalone have been fished in Flinders Bay, near Augusta, Western Australia since the mid - 1960s.

*iii There are natural reproductive components of the stock from which the fishery's catch originates that maintain themselves without having to be restocked every year.*

Studies by Mayfield et al. 2014 based on microsatellite DNA found that south-eastern Australia greenlip abalone comprise small spatially disaggregated populations within a broader overall metapopulation structure (Shepherd & Brown, 1993). Overall, it is estimated that populations generally encompass reef areas of around 30 km<sup>2</sup>, which are largely maintained through self-recruitment, and that distances of up to 130 km are effective barriers to larval dispersal (Mayfield et al. 2014).

More recent research on greenlip abalone populations in WA has been undertaken using a new diagnostic genomic tool utilising Genotyping by Sequencing (GBS) (Sandoval-Castillo et al. 2018). This research found that the genetic structure of greenlip abalone populations was similar in all populations analysed, with the highest diversity detected in the easternmost populations. The screening of genome-wide variation in greenlip abalone samples collected from the wild showed that "neutral" SNPs (i.e. DNA markers that are not under the influence of natural selection) exhibit a pattern of high connectivity, indicating the existence of one well connected metapopulation across the geographic range sampled.

Flinders Bay, located on the southern coast of Western Australia, where the enhanced fishery is based is approximately 19,600 ha (196 km<sup>2</sup>), the enhancement site (lease area) is 413.3 ha (4.13 km<sup>2</sup>) of the sea floor. Significant other greenlip abalone populations occur within 2km. Given the proximity to other wild populations larval transport to and from the enhancement site is likely. The median size of maturity for greenlip abalone is 87mm, consequently with harvesting occurring at approximately 100mm size, there is likely to be self-recruitment within the enhanced population and larval supply to nearby populations. Consequently, due to self-recruitment and linkage to nearby populations it is highly likely that the enhanced fishery population would maintain itself (albeit at a reduced level; in the absence of

extensive harvesting) in the absence of restocking activities. The enhanced population is only a small component of the broader stock in the UoA, and the broader stock is clearly able to maintain itself independent of the restocking activity.

*iv Where fish stocking is used in hatch and catch (HAC) systems, such stocking does not form a major part of a current rebuilding plan for depleted stocks.*

An Abalone Recovery Strategy for greenlip abalone has been drafted and sets out a strategy for rebuilding to the threshold level. It is based on conventional means of closure and Total Allowable Catch (TAC) reduction and does not rely on restocking and does not consider the WAEGAF's population input to the system.

#### **Scope criteria B: Feeding and husbandry**

*i The production system operates without substantial augmentation of food supply. In HAC systems, any feeding is used only to grow the animals to a small size prior to release (not more than 10% of the average maximum weight), such that most of the total growth (not less than 90%) is achieved during the wild phase.*

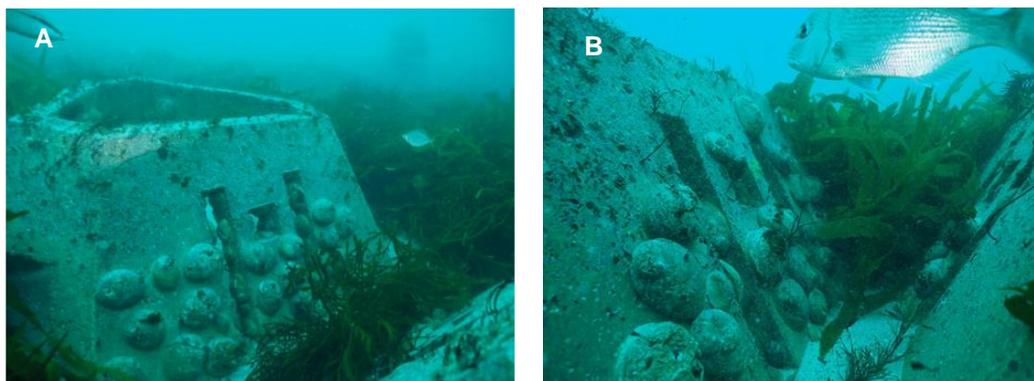
Production data provided by WAEGAF for cohorts released in 2016 (13<sup>th</sup> April and 2<sup>nd</sup> of June) showed an average weight of 13.2g and 7 g (45mm and 38mm in shell length) respectively. The first batch was harvested in December 2017 and harvest continued until October 2020. Abalone weighed 191g on average at harvest, resulting in an estimated 95% growth in the wild. There is no formulated feed used at the site, abalone feed on naturally growing and drifting seaweed only.

#### **Scope criteria C: Habitat and ecosystem impacts**

*i Any modifications to the habitat of the stock are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function.*

Rare Foods Australia Limited (formerly Ocean Grown Abalone Limited) uses purpose-built modules ("ABITATS") made of concrete that provide substrate for abalone to adhere to and for seaweed to get trapped and grow on (Figure 1). The modules are movable as they are put in place by a group of divers. They are retrievable and can be placed on the back of a deployment vessel, for cleaning purposes for example and be redeployed. They are placed in areas that have sand on the ocean floor and are interspersed by seagrass meadows.

The licence condition issued by the Department of Primary Industries and Regional Development (DPIRD) specify that the modules must be less than 10 square meters of total surface area (not including the base that rests on the ocean floor - Condition No 1630 – Ocean Grown Abalone). The licence also stipulates those modules will need to be made from concrete which is sourced in Australia. The modules themselves encourage seaweed growth as the surface matures and attracts spores and colonising weed and other invertebrates. The licence provides details on stocking density which must be kept at below 3 kg whole weight per m<sup>2</sup>.



**Figure 1:** “ABITAT” deployed in situ on the ocean floor. The structure increases the surface area for both abalone and algae to grow on. **A.** Overview of one “ABITAT” with abalone and predominantly drift algae. **B.** Close up showing drift algae of *Ecklonia radiata* and *Sargassum* spp.

Habitat structures (“ABITATS”) have a base footprint of 1.4 m<sup>2</sup>, and approximately 9.3m<sup>2</sup> available surface area (MEMP 2020). The deployment of 10,000 ABITATS over 413 hectares will account for less than 1% of the seafloor within the lease area. As structures can be moved into place they could be removed also if the WAEGAF stops operations in Flinders Bay. Structures are therefore considered “reversible”. They also encourage growth and colonisation of seaweed and therefore provide natural food for the abalone. The only other ecosystem impact that could be perceived is an increase in sedimentation and change in nutrient load in the system, as addressed below.

As part of the licence conditions, the WAEGAF is required to comply with the sediment monitoring program outlined in the company’s Management and Environmental Monitoring Plan (MEMP 2016, 2020). In addition, the MEMP also discussed sampling for water quality and seagrass monitoring.

#### *Nutrients*

The MEMP 2016 outlines that the WAEGAF operation does not add any feed to the lease area, and therefore the only change to normal nutrient flows is to process more of the algal wrack through abalone and then remove part of the processed nutrient when abalone are harvested. Based on the results of the Nutrient Budget, provided in Appendix 1 of the MEMP, monitoring of water quality was not required.

#### *Seagrass Monitoring*

As above, and based on the Nutrient Budget, provided in Appendix 1 of the MEMP, seagrass monitoring was not required.

#### *Sediment Monitoring Program*

WAEGAF production has the potential to alter the flow of nitrogen through the operation. A study, conducted by BMT Oceanica, in 2014 on behalf of Rare Foods Australia Ltd (former Ocean Grown Abalone), demonstrated that the stocking of juvenile abalone, at a production rate of up to 300 t yr<sup>-1</sup>, is not expected to result in significantly altered nutrient levels compared to the background levels known within the area. Organic enrichment and accumulation of organic matter in the sediments and reduced oxygen levels were identified as a potential impact from growing stocked juvenile abalone at the site. Sediment nutrient analyses (total phosphorus, total nitrogen, total organic carbon and sediment redox) were completed in Summer 2015, Winter 2015 and Summer 2016 and no indication of nutrient elevation has been observed even at the final ABITAT and stocking density (MEMP 2020). The frequency of monitoring was therefore amended from seasonal to every 5 years (MEMP 2020).

Considering the information provided it seems reasonable to assume that the WAEGAF is not likely to cause any serious or irreversible harm to the natural ecosystem’s structure and function.

## 5.2 Assessment results overview

### 5.2.1 Determination, formal conclusion and agreement

On completion of the site visit and after finalizing the scoring, ten PIs across three Principles scored less than the Scoring Guidepost (SG) of 80 and ten conditions were assigned (Table 5). The average scores for the three Principles remained above SG80 (Table 4). The draft determination from the assessment team is a recommendation that the fishery should be certified.

### 5.2.2 Principle level scores

Table 4 - Principle level scores	
Principle	UoA 1
Principle 1 – Target species	80.0
Principle 2 – Ecosystem impacts	85.0
Principle 3 – Management system	85.6

### 5.2.3 Summary of conditions

Table 5 – Summary of conditions						
Condition number	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
1	Ensure the stock is highly likely to be above the PRI and is at or fluctuating around a level consistent with MSY.	1.1.1	<b>Exceptional circumstances 2035</b>	<b>Yes</b>	<b>NA</b>	<b>NA</b>
2	By the third annual surveillance audit provide an objective basis for confidence that the partial strategy will work through a combination of improved information and/or a modified strategy.	1.2.5	<b>Year 3 (2025)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
3	By the third annual surveillance audit provide quantitative evidence that the UoA and associated	2.4.2	<b>Year 3 (2025)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>

	enhancement activities comply with both its management requirements and with protection measures afforded to VMEs (seagrass).					
4	By the third surveillance audit provide evidence to the CAB that adequate information continues to be collected to detect any increase in risk to the main habitats.	2.4.3	<b>Year 3 (2025)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
5	By the fourth surveillance audit provide evidence of a tested and evaluated artificial production strategy with sufficient monitoring in place of all aspects of the production, including hatchery, to reasonably ensure with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.	2.5.2	<b>Year 4 (2026)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
6	By the fourth annual surveillance audit provide information of the main impacts of the UoA and associated enhancement activities specifically that is considered adequate and continues to be collected to detect any increase in risk level.	2.5.3	<b>Year 4 (2026)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
7	By the second surveillance audit, ensure that short term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are explicit (i.e., well defined and	3.2.1	<b>Year 2 (2024)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>

	measurable) within the fishery and associated enhancement management system.					
8	By the third surveillance audit, ensure that decision making processes respond to important issues including annual MEMP reporting and take account of the wider implications of decisions such as the broodstock exemption. Information on the fishery performance and management action should be made available if requested.	3.2.2	<b>Year 3 (2025)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
9	By the second surveillance audit, provide evidence that sanctions are consistently applied and that fishers comply and provide required information of importance to effectively manage the fishery, including annual MEMP reports.	3.2.3	<b>Year 2 (2024)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>
10	By the third surveillance audit, the fishery and associated enhancement programs must have in place a mechanism to evaluate key parts of the management system.	3.2.4	<b>Year 3 (2025)</b>	<b>No</b>	<b>NA</b>	<b>NA</b>

### 5.2.4 Recommendations

Recommendation 1 (1.2.5):

The team recommends developing a clear genetic broodstock strategy as was described as a short-medium term aspiration by the WAEGAF at the site visit. This should aim to improve the genetic diversity of the WAEGAF population using broodstock sourced from the wild Augusta population.

Recommendation 2 (2.1.3):

The team recommends maintaining records of all other non-target species removals including predator removals like octopus and rock lobster to demonstrate that these species continue to be categorised as minor species using the MSC guidance (SA 3.4.2.1).

## 6 Traceability and eligibility

### 6.1 Eligibility date

The target eligibility date for product from the fishery to bear the MSC label is the 30 June 2022, which is the anticipated certification date.

### 6.2 Traceability within the fishery

**Table 6 – Traceability within the fishery**

Factor	Description
<p>Will the fishery use gears that are not part of the Unit of Certification (UoC)?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip, on the same vessels, or during the same season;</li> <li>- How any risks are mitigated.</li> </ul>	<p><i>No, abalone are harvested using dive assistant hand collection method.</i></p>
<p>Will vessels in the UoC also fish outside the UoC geographic area?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip;</li> <li>- How any risks are mitigated.</li> </ul>	<p><i>No. All vessels harvesting greenlip abalone from the "enhanced fishery" are owned by Rare Foods Australia Ltd (former Ocean Grown Abalone) and are not permitted to operate outside the lease area which is the UoC. There is VMS on the vessel for identification.</i></p>
<p>Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <ul style="list-style-type: none"> <li>- Transport</li> <li>- Storage</li> <li>- Processing</li> <li>- Landing</li> <li>- Auction</li> </ul> <p>If Yes, please describe how any risks are mitigated.</p>	<p><i>The processing facility in Augusta handles greenlip abalone from the "enhanced fishery" as well as from the wild sector. However, the greenlip from the wild sector are also certified. The facility occasionally processes farmed abalone from the hatchery farm. These abalone are easily identifiable by the shell, have a designated consignment note number and are packed into different branded boxes.</i></p>
<p>Does transshipment occur within the fishery?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If transshipment takes place at-sea, in port, or both;</li> <li>- If the transshipment vessel may handle product from outside the UoC;</li> <li>- How any risks are mitigated.</li> </ul>	<p><i>There is no transshipment in the fishery.</i></p>

<p>Are there any other risks of mixing or substitution between certified and non-certified fish?</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p><i>There are no other risks of mixing certified and uncertified product. Total numbers and weights of enhanced abalone based on harvest records and consignment and batch numbers are all verifiable and mitigates the possibility of substitution with recreational catch</i></p>
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### 6.3 Eligibility to enter further chains of custody

Only product harvested from the Rare Foods Australia (RFA) lease area in Flinder’s Bay and landed at the processing facility at the Augusta Marina, Western Australia (the only eligible landing point) is eligible to use the fishery certificate and sell product as MSC certified. There are currently four dive boats used for harvesting, a 60 ft vessel used for ABITAT deployment and a science boat used for R & D activities.

The scope of this certificate includes the processing facility at the Augusta marina. Chain of Custody starts where product leaves the Augusta marina and there is a change of ownership of product. Products include live and frozen abalone (meat only and with the shell) and sliced abalone meat.

## 7 Scoring

### 7.1 Summary of Performance Indicator level scores

Principle	Component		Performance Indicator (PI)	Score
<b>One</b>	Outcome	1.1.1	Stock status	60
		1.1.2	Stock rebuilding	80
		1.1.3	Genetic outcome	80
	Management	1.2.1	Harvest strategy	95
		1.2.2	Harvest control rules & tools	80
		1.2.3	Information & monitoring	80
		1.2.4	Assessment of stock status	90
		1.2.5	Genetic management	75
	1.2.6	Genetic Information	80	
<b>Two</b>	Primary species	2.1.1	Outcome	100
		2.1.2	Management strategy	80
		2.1.3	Information/Monitoring	85
	Secondary species	2.2.1	Outcome	80
		2.2.2	Management strategy	85
		2.2.3	Information/Monitoring	80
	ETP species	2.3.1	Outcome	100

		2.3.2	Management strategy	80
		2.3.3	Information strategy	80
		Habitats	2.4.1	Outcome
	2.4.2		Management strategy	75
	2.4.3		Information	75
	Ecosystem	2.5.1	Outcome	80
		2.5.2	Management	75
		2.5.3	Information	75
		Translocation	2.6.1	Outcome
2.6.2			Management	95
2.6.3			Information	100
<b>Three</b>	Governance and policy	3.1.1	Legal &/or customary framework	100
		3.1.2	Consultation, roles & responsibilities	100
		3.1.3	Long term objectives	100
	Fishery specific management system	3.2.1	Fishery specific objectives	70
		3.2.2	Decision making processes	75
		3.2.3	Compliance & enforcement	70
		3.2.4	Monitoring & management performance evaluation	70

## 7.2 Principle 1

### 7.2.1 Principle 1 background

This document draws on material, rationales and text from the MSC Public Certification Report (Daume et al. 2017) and audits of the Western Australia abalone fishery which includes the broader greenlip stock assessed in this UoA. The biological background in particular is a derivative of that in Hart et al. 2017 which was included in Daume et al. 2017, with particular focus on greenlip abalone and elements pertinent to this UoA.

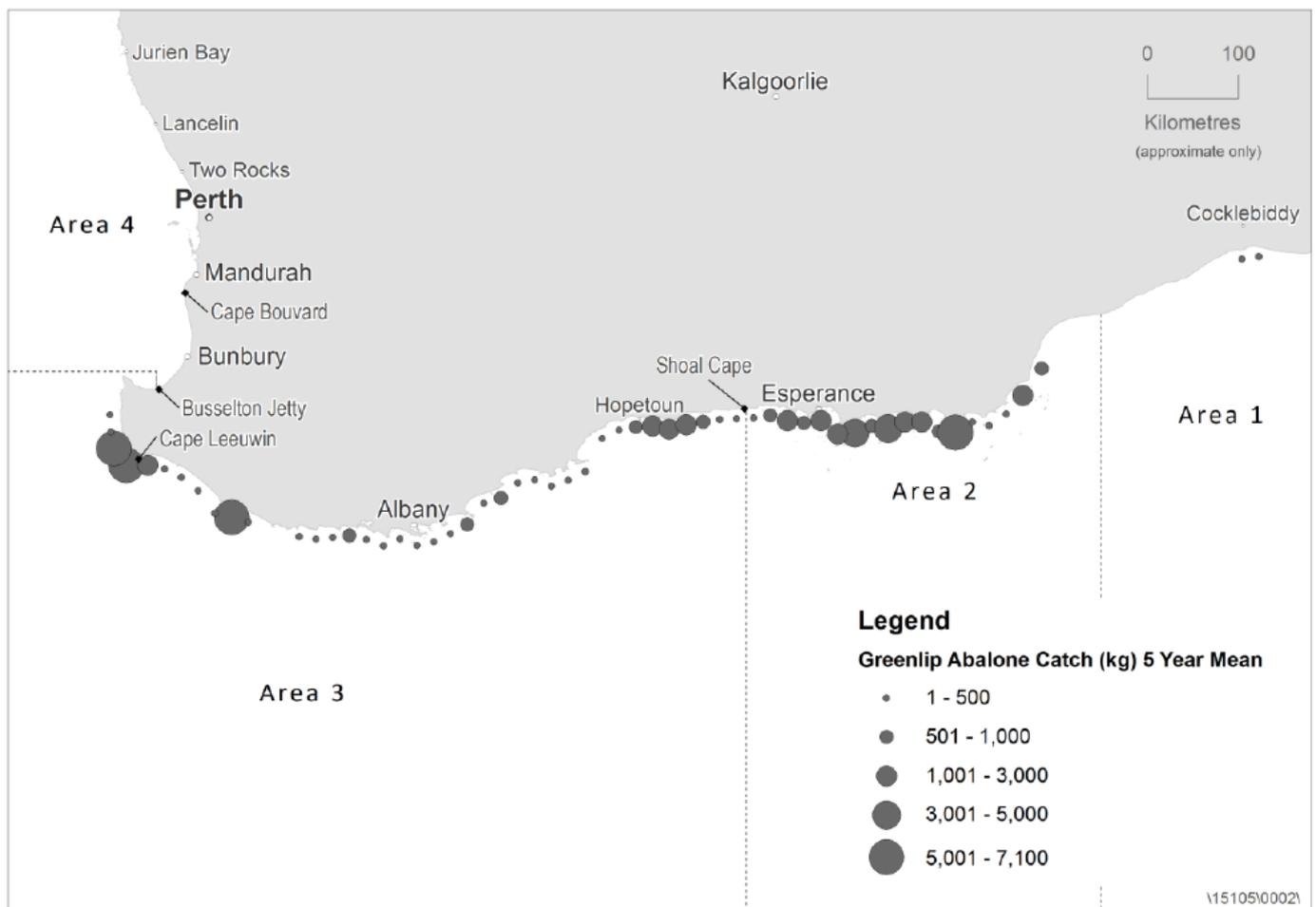
#### Biological background

#### Taxonomy and distribution

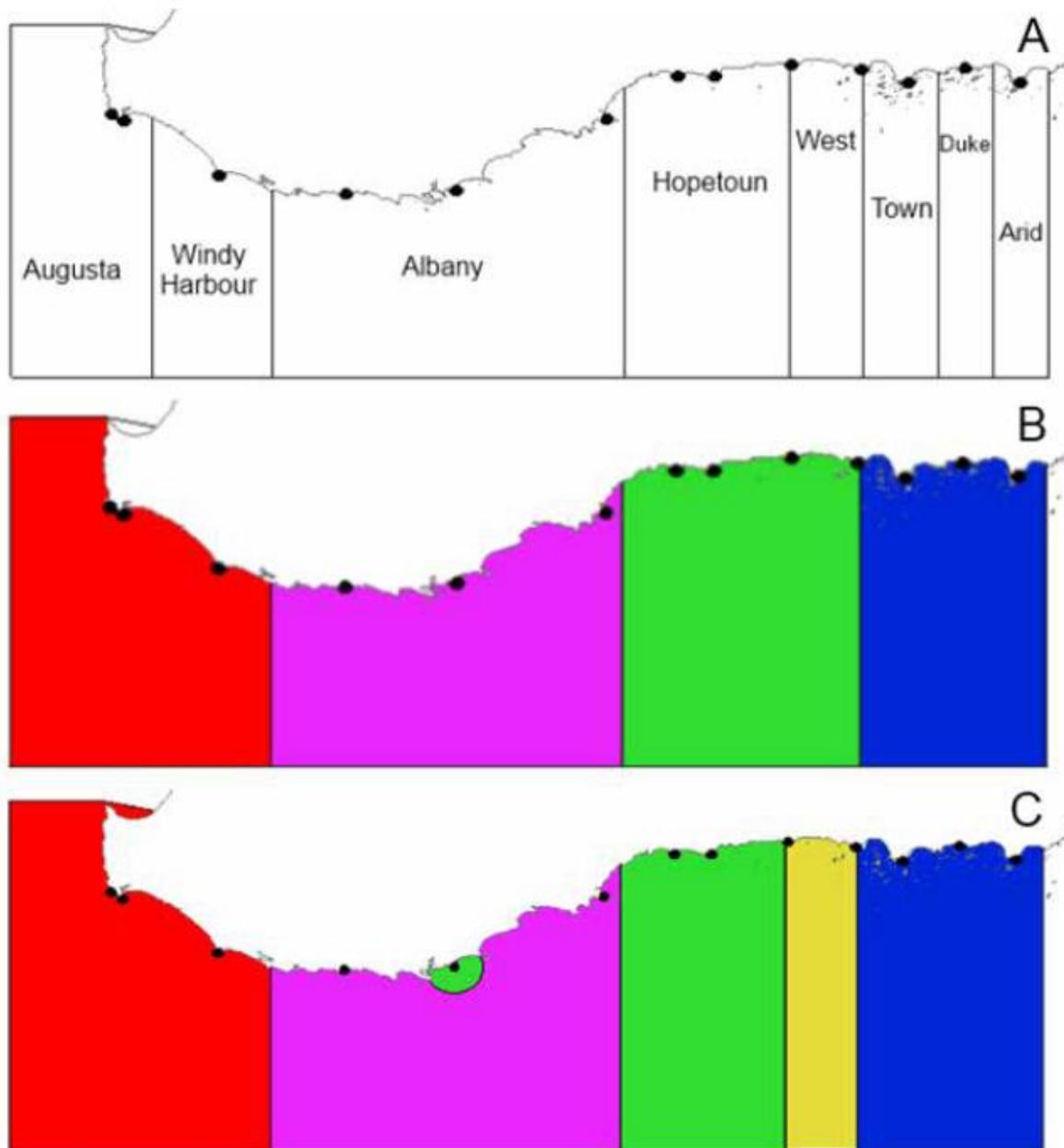
Greenlip abalone (*Haliotis laevigata*) is a temperate endemic Australian species that belongs to the Family Haliotidae. The distribution of greenlip abalone extends from the south-west of WA to Tasmania (Geiger & Owen 2012).

#### Stock structure

Note that this section is based largely on text from Hart et al. 2017. The genetic structure of greenlip abalone has been investigated in south-eastern Australia (Mayfield et al. 2014) and more recently in WA (Sandoval-Castillo et al. 2016 and Sandoval-Castillo et al. 2018).



**Figure 2.** Commercial greenlip abalone catch between 2009 and 2014. Management areas are indicated, the WAEGAF lease is located close to Cape Leeuwin (Source: Hart et al. 2017).



**Figure 3.** A: Management sub-areas for the commercial Western Australian greenlip abalone fishery, B: Oceanographic regions detected by PCA-based analysis of six oceanographic variables. C: Geographic distribution of the Greenlip abalone genetic clusters based on 1,026 "outlier" SNPs. (Source: Sandoval-Castillo et al. 2016).

Studies by Mayfield et al. (2014) based on microsatellite DNA found that south-eastern Australia greenlip and blacklip abalone comprise small spatially disaggregated populations within a broader overall metapopulation structure (Shepherd & Brown, 1993). Genetic studies showed significant differences in allele structure between populations at a relatively fine scale of tens of kilometres, such that stocks are composed of local populations linked by occasional larval dispersal into metapopulations. Genetic subdivision indicated that greenlip abalone do not comprise a single, large, panmictic population across SE Australia. Differentiation was evident at the two scales: among biogeographic regions (i.e., hundreds of kilometres) and among locations within regions (i.e., tens of kilometres). Overall, it has been estimated that populations generally encompass reef areas of around 30 km<sup>2</sup>, which are largely maintained through self-recruitment, and that distances of up to 130 km are effective barriers to larval dispersal (Mayfield et al. 2014).

More recent research on greenlip abalone populations in WA has been undertaken using a new diagnostic genomic tool utilising Genotyping by Sequencing (GBS) (Sandoval-Castillo et al. 2018). This research found that the genetic structure of greenlip abalone populations was similar in all populations analysed, with the highest diversity detected in the easternmost populations. The screening of genome-wide variation in greenlip abalone samples collected from the wild showed that “neutral” SNPs (i.e. DNA markers that are not under the influence of natural selection) exhibit a pattern of high connectivity, indicating the existence of one well connected metapopulation across the geographic range sampled.

However, when only a section of genome under selection (adaptive loci) was considered, five genetically distinct groups can be clearly defined. These are shown in Figure 3:

- 1) the western part of the greenlip abalone distribution (from Outback to Windy Outside);
- 2) the Albany sub-area (Parrys Bay and Whalebone Port);
- 3) the Hopetoun sub-area (from Inner Island to Mason);
- 4) the West sub-area (Fanny Cove and Burton Rocks); and
- 5) the eastern sampling area (from Rob Island to Gulch).

These corresponded to geographic regions characterised by differences in oceanography, particularly differences in oxygen. The genetic differentiation detected is likely to be adaptive so that the fitness/performance of the abalone in those locations in relation to dissolved oxygen in the water is likely to be superior (Sandoval-Castillo et al. 2018). The WAEGAF lease is located in the first of these genetically distinct groups near the Westerly most location sampled by Sandoval-Castillo et al. 2018.

Despite the connectivity indicated by the neutral SNPs it is thought that increased fitness of locally adapted larvae maintains the genetically distinct groups detected by the adaptive loci. As such larval supply from other regions may be important for allowing further adaptation to changing environmental conditions.

The stock and fishery operate primarily in areas 2 and 3 with a small TACC also set for Area 1 (1200kg for 2022/23). The commercial catch stretches approximately 900km of coastline along areas 2 and 3. This covers most of the distribution of greenlip abalone within Western Australia. It is estimated that 80% of larvae released in this area reach boundary currents responsible for long-distance transport and prevailing currents can promote eastward dispersal from Cape Leeuwin (the location of the WAEGAF lease; Sandoval-Castillo et al. 2018).

## Life History

Note that this section is based largely on text from Hart et al. 2017.

## Habitats and Movements

Greenlip abalone inhabit suitably exposed hard surfaces (usually granite or limestone) on subtidal rocky reefs between 1 and 40 m depth, however, the commercial fishery primarily targets the 5 to 25 m depth range. The habitats need to be firm enough to provide a suitable substrate for attachment, be capable of trapping floating seaweed which the abalone feed on and be sufficiently endowed with a supply of certain types of red algae (Rhodophyta) which are the preferred food source for these species (Shepherd & Steinberg 1992). The delicate structure and susceptibility of red algae to wave exposure ensures that the highest swell-exposed areas are usually sub-optimal habitat. The largest populations of greenlip abalone are traditionally found in the Augusta and Cape Arid regions of WA, which are characterised by small island complexes and headlands that buffer the southerly swells, create localised hydrodynamics that promote recruitment, and allow sufficient seagrass meadows and Rhodophyte communities to

develop. Seagrass meadows are particularly important due to the prevalence of epiphytic red algae that are the sought-after food species. The typical feeding pattern arises after sustained oceanic swells dislodge the algae and render them available to be trapped within the reef complexes and consumed by the resident abalone populations.

A habitat survey of 32 hectares of commercially productive greenlip abalone reefs in Flinders Bay, Augusta established that abalone-specific habitat comprised only about 3% of the total area, the surrounding seagrass and associated macroalgal communities comprised around 30% of the total area (Hart et al 2015). Within the rocky-reef complexes abalone abundance is positively correlated with area of available habitat and density of other co-occurring invertebrates such as the purple sea-urchin (Hart et al. 2013b), indicating that the structural complexity of a reef dictates its carrying capacity and diversity for both abalone and the reef community in general.

Greenlip abalone are sedentary animals and generally only make small-scale movements within their local habitats, primarily to feed. Experimental investigations of stock enhancement in greenlip abalone tracked cohorts for over 6 years and found that 90% of animals moved less than 5 m from the point of release (unpublished data discussed in Hart et. al. 2017).

## **Reproduction**

Abalone are broadcast spawners. The ova develop into a veliger stage and settlement usually occurs around eight to 10 days post-hatching. When they are ready to metamorphose, they settle onto suitable habitat. Evidence has been found for the preferential selection onto certain habitat based on chemical cues emanating from coralline algae and biofilms that have been grazed by conspecifics (Daume et al. 1999; Roberts 2001).

Size-at-maturity for greenlip abalone varies with growth and averages between 78 and 97 mm in WA (Hart et al. 2017). Based on growth rate, age-at-maturity is around three years, although there is some evidence that maturation is not entirely age dependent and can be accelerated under optimal conditions (McAvaney et al. 2004).

The breeding season of greenlip abalone varies between locations but is generally confined to the spring/summer months. Shepherd et al. (1992) found an extended season from September to March at one location, and a restricted season (December) at another location in South Australia. In WA, the spawning months were also confirmed as between October and December, with a peak in December (Wells and Mulvay 1992). Some sites showed evidence for partial spawning during the late summer months and it is likely that the exact timing within a season varies from year to year and location to location depending on the food availability (primarily dictated by swell) and temperature regime.

## **Size-Fecundity Relationships**

Egg production by an individual female can be very high. Individual fecundity of large females has been measured at up to 8 million eggs in Greenlip abalone from both WA (Wells and Mulvay 1992), and South Australia (Shepherd et al. 1992).

## **Factors Affecting Recruitment of Juveniles**

Recruitment of two-year old juveniles in greenlip has been shown to be density-dependent, with the likely mechanism hypothesised to be limitation in appropriate crevice habitat for sheltering juveniles (Dowling et al. 2004). However, the degree to which this occurs is location-specific, with areas carrying a higher proportion of suitable juvenile habitat exhibiting less density dependence. For example, Hart et al. (2013b, c) experimentally increased recruitment of greenlip abalone through a series of stock

enhancement experiments, which resulted in significantly increased adult densities in the short-term, indicating that density dependence had not limited survival of recruits at those sites. Dixon (2011) experimentally examined density dependence in juvenile greenlip abalone by constructing and modifying experimental boulder habitats and found a strong density dependence effect on growth, and a significant, but weaker, density dependent effect on survival. An environmental signal affecting recruitment of both greenlip abalone and invertebrates in general on the west coast of South Australia was also postulated by Dowling et al. (2004), but the mechanism remains unconfirmed. Allee effects (or depensation) have also been implicated in the collapse of recruitment due to the importance of aggregation for fertilisation success and Dowling et al. (2004) constructed a stock-recruitment curve that incorporated a parameter (the x-intercept) for depensation in greenlip abalone in South Australia. A preliminary fit of this curve to WA stocks of greenlip abalone did show a positive x-intercept but the data needs to be interpreted with caution as it comprises different populations due to lack of long-term data within populations (Hart et al. 2017).

### **Age and Growth**

Abalone exhibit large spatial heterogeneity in growth and “stunted” populations occur in all abalone fisheries (Wells & Mulvey 1992). In the case of greenlip abalone, comparisons of growth parameters from tag-recapture studies across Australia reveal wide variability within and between fisheries.

### **Natural Mortality**

Natural mortality ( $M$ , year<sup>-1</sup>) in greenlip abalone has been well studied, and long-term mark-recapture experiments are available for wild populations in both South Australia (Shepherd 1990) and WA (Hart et al. 2013a). A summary for estimates of natural mortality in South Australian greenlip abalone found in Mayfield et al. (2003), and Dixon et al. (2006) presented additional experimental results of juvenile mortality rates. Greenlip abalone exhibit size-dependent mortality, with  $M$  being initially high and declining with increasing size, levelling out at around 0.15 to 0.25 year<sup>-1</sup> for large adults (Hart et al. 2017). The mid-point of this range (0.2 / year) has been used for calculating the generation time used in development of a recovery plan (DPIRD 2020).

### **Diet**

As described in Section 5.1.3.8 of Hart et al. (2017), abalone are herbivores and feed on the most prevalent type of algae found in their particular area. The plasticity in growth in greenlip abalone is hypothesized to be primarily caused by food limitation, as their relatively sedentary nature renders them susceptible to the localised algal productivity and habitat complexity.

## **Western Australia enhanced greenlip abalone fishery operated by Rare Foods Australia (RFA) Limited (former Ocean Grown Abalone -OGA- Limited)**

The WAEGAF fishing activity takes place in the lease shown in Figure 7. Prior to the commencement of the WAEGAF activity this area consisted of sandy seabed that supported minimal/no greenlip abalone populations. Artificial concrete structures called ABITATs have been placed on this bottom to provide suitable habitat for greenlip abalone. A total of 9,652 ABITATs have been placed to form the sea-ranch (DPIRD 2020b).

Juvenile abalone are translocated frequently from the land-based farm site to the sea-ranch. The land based hatchery operations consists of five facilities:

- Broodstock holding facility – in which wild caught broodstock are kept separate to minimise the risk of introducing disease. This facility has its own water supply and there is no discharge, with waste water directed to a sand infiltration gallery.
- Nursery facility– houses stock from settlement to juvenile stage.
- Weaning facility – which house abalone from 6 months to 1.5 years old.
- Growout facility – which holds stock until they are marketable size.
- Quarantine holding facility – consists of a deep tank, where abalone are held for two weeks before being exported off site.

Once moved to the ABITATs, the abalone require no further feeding as stocking densities are held sufficiently low that the algal wrack drifting in the water column supplies sufficient nutrition to maintain rapid growth, low mortality and good health. Each ABITAT is estimated to produce 15kg of live weight harvest per year (Ocean Grown Abalone 2020). Thus, the current facility could produce 150t at full production and there is scope to increase this to 225t through addition of an additional 5,000 ABITATs. Recent production has been significantly less than this as the facility is being developed.

Abalone are harvested from the ABITATs by divers upon reaching a size of 110-130mm (OGA 2020). For example, in 2019 the average harvest length was 109.8mm. The size of harvest on the ranch is dictated by the operator, however current practices allow for a period of egg production prior to harvest – an estimate for the magnitude of this has not been produced.

A range of policies and guidance exist to ensure that hatchery and farming activity has minimal risks of impacts such as spread of disease, degradation of the ecosystem and impacts on the wild population. This includes the FRMA 1994, the FRMR 1995 and Abalone Aquaculture in Western Australia (DoF 2017). The interaction between these documents and their application remains somewhat unclear and the intended nature of operation of the WAEGAF as stipulated in Hart et. al. 2017 has changed over time. For example, earlier documents indicated that only F1 can be seeded, whilst the more recent “Abalone Aquaculture in Western Australia” (DoF 2017) indicates that selective breeding starting with WA broodlines may be permitted in marine abalone farms.

Nevertheless, these policies have translated into a set of licence conditions for the WAEGAF including setting the maximum number of ABITATs and maximum stocking densities. The WAEGAF’s Management and Environmental Monitoring Plan (MEMP; OGA 2020) includes a broader range of measures to reduce the risks of impacts such spread of disease, degradation of the ecosystem and impacts on the wild population.

## Commercial fishery

A commercial dive fishery managed by DPIRD takes place across the Western Australian stock outside of the lease area. This is described in more comprehensive detail in Hart et. al. 2017. Commercial diving for abalone in Western Australia began in the early 1960s when there were no controls, and the fishery was open access. The fishery initially focused on harvesting Roe’s abalone stocks around Perth, before expanding to also include greenlip abalone and then brownlip abalone from 1985.

The first set of effort controls were introduced in 1971 in response to the rapid increase of catch and licence holders, and formal spatial management was introduced in 1975. Daily bag limits were in place for the Perth commercial fishery from 1978 to 1998, and minimum legal lengths were introduced in 1993. Changes in size limits and area closures have been an ongoing and regular management practice in these fisheries.

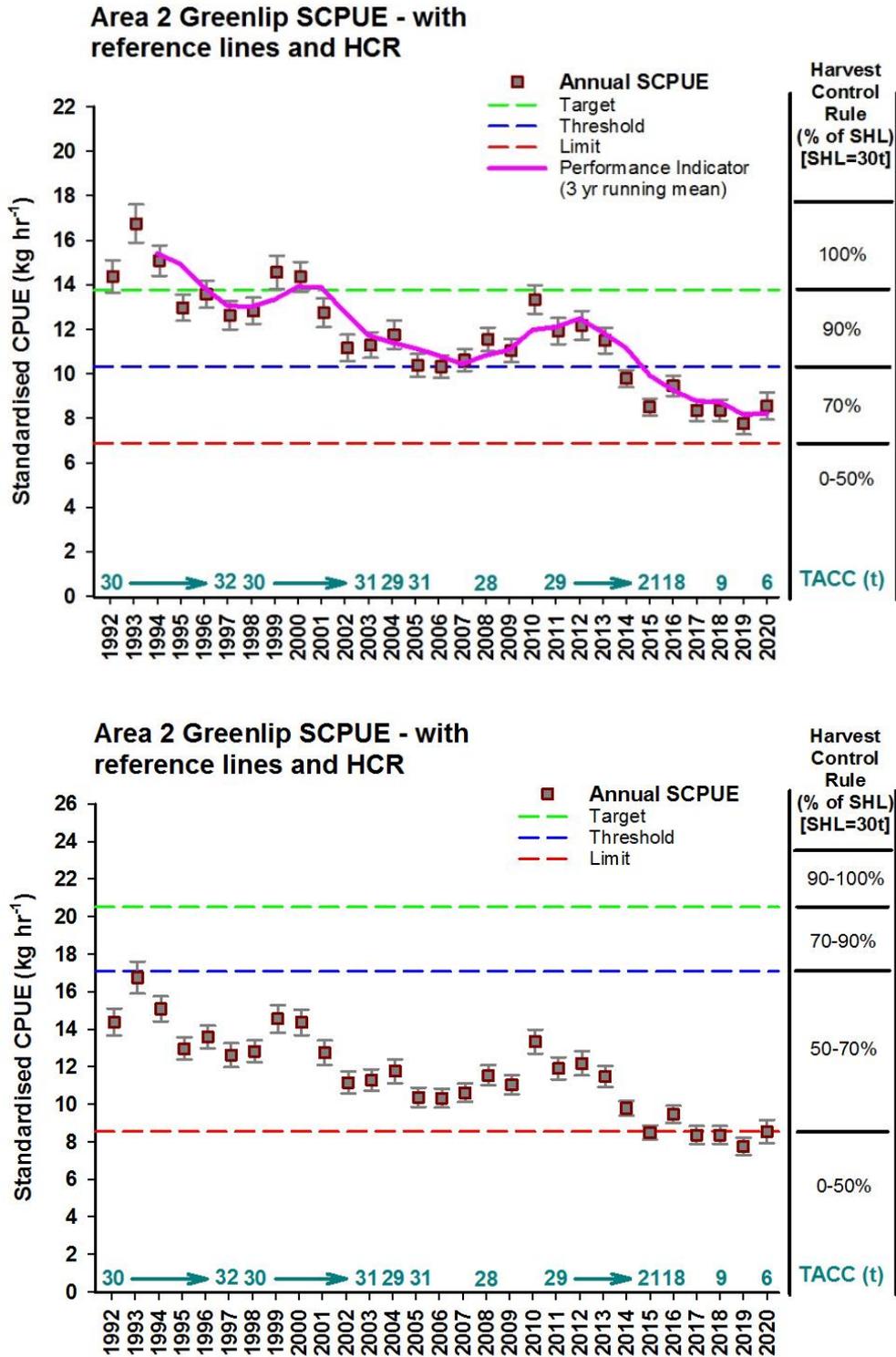
A voluntary Total Allowable Commercial Catch (TACC) was set in Zone 1 in 1985, with other zones following in subsequent years. Non-transferable Individual Quotas were initially in place for the greenlip and brownlip fisheries, however, were deemed no longer suitable after a drop in catch in 1990. Greenlip catches dropped rapidly after the introduction of the TACC to around 70 tonnes in 2000 and have further declined since 2013 as a result of decreasing stock abundance and consequent TACC reductions and voluntary catch reductions. Area 3, which contains the WAEGAF lease, has declined from 35t TACC in 2013 to 4t in 2020. This decline has generally been attributed to environmental factors, commencing with a heatwave in south-western Australian waters in 2010/11. When contrasting to other Australian greenlip abalone fisheries it is important to note that the TACC's here are measured in meat weight, not whole weight.

Standardised CPUE (sCPUE) is the primary stock status indicator. Standardised CPUE is calculated in a two-step process, the first step involves adjustment of CPUE to account for technical correction factors (such as improved availability of weather forecasts). The second step involves a generalized linear model (GLM) model which accounts for month, subarea and diver (Hart et al. 2017). This process has been revised to investigate the impact of the Augusta sub-area closure. Recent efforts on improving sCPUE have focussed on the development of improved model-based reference points which are consistent with the sCPUE index.

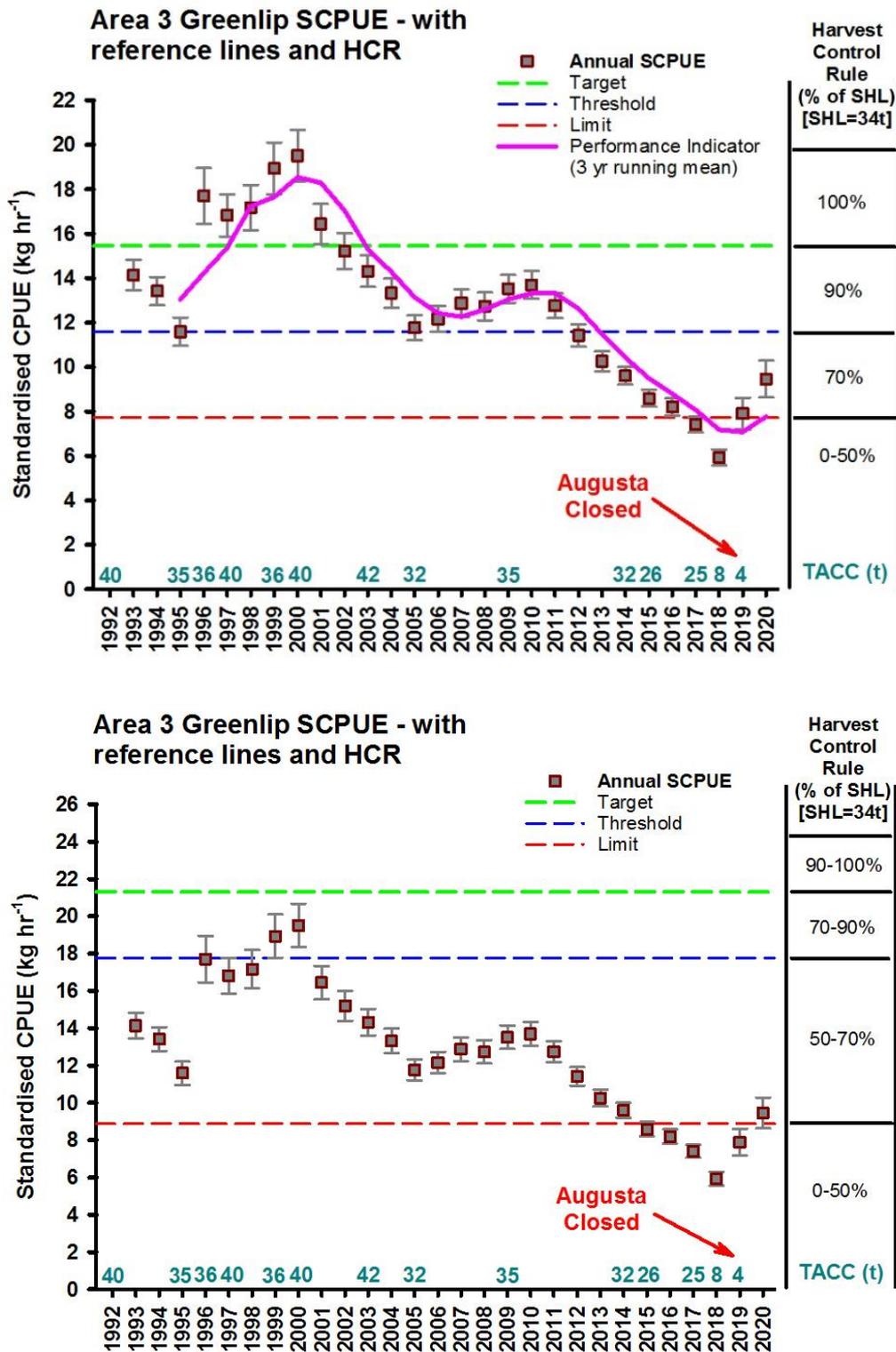
sCPUE clearly shows the biomass declines in Figure 4 and Figure 5, reaching record lows in both areas in 2019 (Strain et al. 2021). The most recent assessed year (2020) showed the first sign of an increase in sCPUE for an extended period (the 2019 increase in Area 3 was entirely due to the closure of the lowest CPUE sub-area, Augusta).

In response to declining CPUE, a stock rebuilding strategy was developed (DPIRD 2020) as discussed in PI 1.1.2.

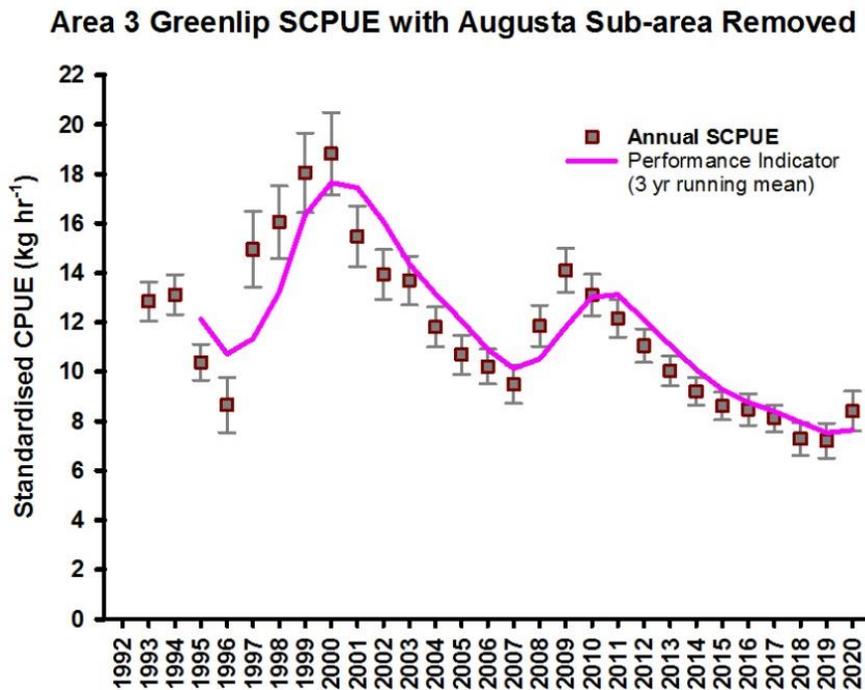
The harvest strategy is being revised to form a new 2021-2026 harvest strategy (DPIRD 2022). A near finalised harvest strategy has been considered here. This includes substantial updates of the reference points to be based on model derived estimates of  $B_{MSY}$ .



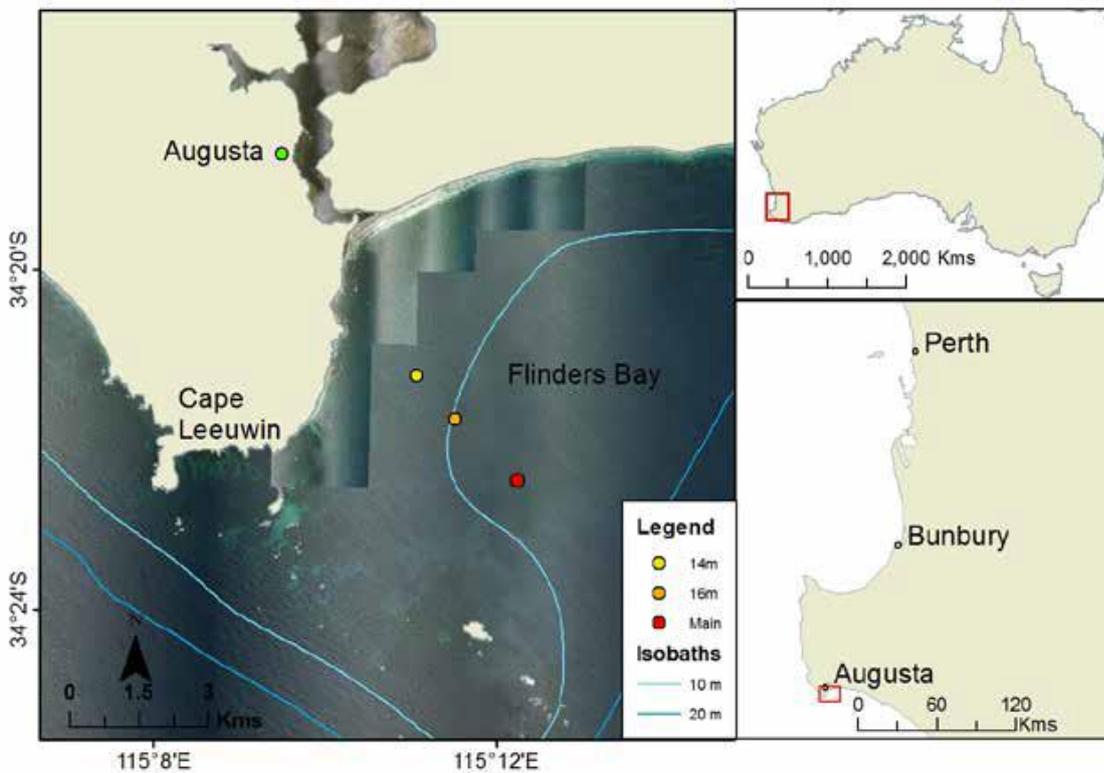
**Figure 4.** Top: The annual standardised CPUE (kg.hr<sup>-1</sup>) for greenlip abalone with the performance indicator (3 year running mean), reference levels (target, threshold and limit) and harvest control rule in Management Area 2. Bottom: The same sCPUE time series with the new reference points.



**Figure 5A.** Top: The annual standardised CPUE (kg.hr-1) for greenlip abalone with the performance indicator (3 year running mean), reference levels (target, threshold and limit) and harvest control rule in Management Area 3. Bottom: The same sCPUE time series with the new reference points (note the y-axis limits differ between the two plots, hence the 95% CIs appear more compact in the bottom plot despite being the same).



**Figure 5B.** The annual standardised CPUE (kg.hr<sup>-1</sup>) for greenlip abalone with the performance indicator (3 year running mean), reference levels (target, threshold and limit) and harvest control rule in Management Area 3 with sub-area Augusta (which was closed in 1919) removed.

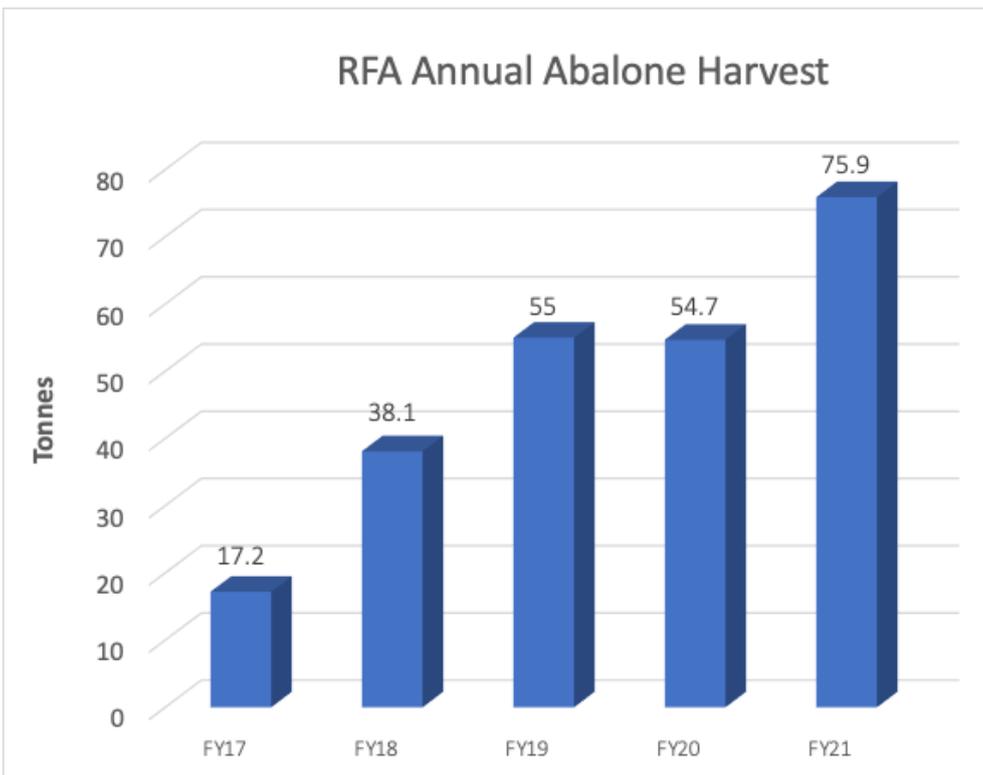


**Figure 6.** Flinders Bay, Western Australia where the enhanced fishery is located, indicating depth and aerial photography showing lighter areas of sand and darker areas of seagrass or reef (source: Lewis 2015).

### 7.2.2 Catch profiles

### 7.2.3 Total Allowable Catch (TAC) and catch data

Table 7 – Total Allowable Catch (TAC) and catch data				
TAC	Year	<b>NA</b>	Amount	<b>NA</b>
UoA share of TAC	Year	<b>NA</b>	Amount	<b>NA</b>
UoA share of total TAC	Year	<b>NA</b>	Amount	<b>NA</b>
Total green weight catch by UoC	Year (most recent)	<b>2021</b>	Amount	<b>75.9 t</b>
Total green weight catch by UoC	Year (second most recent)	<b>2020</b>	Amount	<b>54.7 t</b>



**Figure 7:** Annual Abalone Harvest (2017-2021), RFA (2022).

### 7.2.4 Principle 1 Performance Indicator scores and rationales

#### PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is <b>likely</b> that the stock is above the point where recruitment would be impaired (PRI).	It is <b>highly likely</b> that the stock is above the PRI.	There is a <b>high degree of certainty</b> that the stock is above the PRI.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

The WAEGAF population utilises artificial habitat – i.e., ABITATS. Prior to the introduction of this habitat there was no abalone population in the lease area. Consequently, the population here has provided some additional recruitment to the broader stock and the harvest of this population does not negatively impact the recruitment dynamic that took place prior to the commencement of this activity.

Outside of the lease area the catch is dominated by the commercial fishery with spawning biomass primarily protected by the total allowable catch and the legal minimum size. The status of this stock was relatively stable until a major heatwave occurred in 2010/11. The heatwave resulted in declines of greenlip abalone and many other species in the region (Hart et al. 2017). This effect was noted in the primary stock status indicator – standardised catch rate (sCPUE) which decreased consistently from 2011 in Area 3 and 2013 in Area 2 onwards despite substantial catch decreases. The absence of a lag between declines in legal sized stock and recruits indicates that the decline is consistent with environmental factors rather than fishing induced decline in recruitment (Hart et al. 2017).

The trend in sCPUE indicates that stock abundance has been declining in both areas of the fishery for the last 7-9 years. In 2019 the 3-year running mean of sCPUE fell to record lows in both areas. However, in 2020 the sCPUE increased in both areas, including a modified index that took into consideration the closure of the Augusta sub-area (Strain et al. 2021). This increase was sufficient to raise sCPUE above the limit reference point specified in the 2016-2021 harvest strategy.

The new 2021-2026 harvest strategy (DPIRD 2022) is currently in draft stage and specifies new reference points which are based on model estimates of  $B_{MSY}$  and are higher than the previous reference points. The limit reference point is set at  $0.5 B_{MSY}$ . When compared to the new reference points the 2020 sCPUE is approximately equal to the limit reference point in Area 2 and just above it in Area 3.

The minimum size limit outside of the lease area is high relative to size at onset of maturity and provides protection of an estimated 40% of the spawning biomass (Hart et al. 2013a). In both areas, after an extended period of decrease, mean meat weight has increased at some point in the last few years providing some indication that exploitation rates have effectively been reduced. The Augusta sub-area has been considered of greatest concern across the stock and was closed to commercial fishing in 2019. A fisheries independent survey conducted in this sub-area found that juvenile density has increased in 2018-2020 after record lows in 2014-2017. Broodstock for the WAEGAF operation are obtained from the Augusta sub-area for genetic reasons (see PI 1.1.3, 1.2.5 and 1.2.6). This allows for a maximum of 300 mature individuals per annum, however this has not been taken for many years. Recreational catch in

this area is estimated at < 1t. Combined this is unlikely to substantially impact the Augusta sub-area population and have negligible impact on the overall biomass of the stock.

A risk analysis utilising a range of modelling approaches found that Area 2 had a 5-20% chance of being below the limit reference point, whilst Area 3 had a 20-50% chance (DPIRD in prep). This satisfies the SG60 requirement of it being likely (>70%) that area is above the PRI, whilst it is unclear if this is the case for Area 3. However, taking into consideration the protection afforded by the size limit, the dramatic reductions in catches, positive signs in secondary indicators and the additional recruitment provided by the new population in the lease area, we conclude that it is likely that the overall stock is above the point where recruitment would be impaired. Consequently, SG60 is met.

While it is likely that the Greenlip abalone stock is above the PRI these concerns provide sufficient doubt that it cannot be said that it is highly likely that the stock is above the PRI. Consequently, SG80 is not met.

Stock status in relation to achievement of Maximum Sustainable Yield (MSY)				
<b>B</b>	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a <b>high degree of certainty</b> that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		<b>No</b>	<b>No</b>
Rationale				

The WAEGAF population is managed entirely on a commercial basis. The activity has been steadily increasing over recent years and evidence indicates that it is being managed towards the maximum allowable stocking density (DPIRD 2020b). The commercial interests of the operator align with MSY, consequently this component of the population would meet the requirements of SG80.

However, the broader population is clearly below a level consistent with MSY. Threshold reference points corresponding to MSY have been established for both areas. The fishery has only occasionally exceeded these and due to the declines described in scoring issue a, and the P1 background, the stock is currently clearly well below these. Consequently, SG80 is not met.

References

DPIRD (2020b) 2020 Ocean Grown Abalone – Biomass Survey, 8pp

DPIRD (2021) Fisheries Management Paper No. 283: Abalone Resource of Western Australia Harvest Strategy 2021-2026, Version 2.0, 52pp

DPIRD (In prep) Abalone Resource Assessment Report, in preparation.

Hart, A.M., Fabris, F.P., Brown, J., Caputi, N. (2013a). Biology, history, and assessment of Western Australian abalone fisheries. Fisheries Research Report No 241, Department of Fisheries, Western Australia, 90 pp.

Hart, A.M., Strain, L., Hesp, A., Fisher, E., Webster, F., Brand-Gardner, S., Walters, S. (2017). Marine Stewardship Council Full Assessment Report Western Australian Abalone Managed Fishery.

Lewis, P., 2015. Further investigation into critical habitat for juvenile dhufish (*Glaucosoma hebraicum*), artificial habitats and the potential to monitor annual juvenile recruitment. NRM Project 09038 – Protecting inshore and demersal finfish. Fisheries Research Report No. 265. Department of Fisheries, Western Australia. 80pp.

Strain, L, Hart, A., Jones, R. (2021) Western Australian Marine Stewardship Council Report Series No. 8: Western Australian Abalone Managed Fishery Addendum 4, 28pp

Stock status relative to reference points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (Sia)	3y moving average of sCPUE; 0.5B <sub>MSY</sub>	Area 2: 8.5 kg meat weight/hour Area 3: 8.9 kg meat weight/hour	Area 2: 8.6 kg meat weight/hour Area 3: 9.5 kg meat weight/hour
Reference point used in scoring stock relative to MSY (Sib)	3y moving average of sCPUE; 1.0B <sub>MSY</sub>	Area 2: 17.1 kg meat weight/hour Area 3: 17.7 kg meat weight/hour	As above

Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage

Draft scoring range	<b>60-79</b>
Information gap indicator	<p><b>More information sought</b></p> <ul style="list-style-type: none"> <li>Quantitative assessment against the new reference points outlined in the 2021-26 harvest strategy.</li> <li>The rationale for the reference points outlined in the 2021-26 harvest strategy and how they relate to the SG levels for the scoring issues in this PI.</li> <li>Any updated information on SoM, particularly for the WAEGAF population.</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>60</b>
Condition number (if relevant)	<b>1</b>

### PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
<b>a</b>	Rebuilding timeframes		

	Guide post	A rebuilding timeframe is specified for the stock that is the <b>shorter of 20 years or 2 times its generation time</b> . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed <b>one generation time</b> for the stock.
	Met?	<b>Yes</b>		<b>No</b>
Rationale				

An abalone resource recovery plan has been produced (DPIRD 2020a, DPIRD 2022). This recovery plan is based on area 3, however it is now also being applied to area 2 as these breaches the new limit reference point. The recovery plan specifies a rebuilding timeframe of 16 years. This is based on twice the generation time of greenlip abalone calculated as 2 x 8 years, (calculated as 1/M+A<sub>50</sub> maturity, where M is assumed to be 0.2 and A<sub>50</sub> maturity is 3 years). The historical response of the stock to changes in catch shows that rebuilding at lower catch can occur within the two-generation period. Thus, the specified rebuilding timeframe is feasible and meets the requirements of SG60.

The shortest possible recovery timeframe is unclear and as the recovery plan is based around a two-generation period it clearly does not meet SG100.

Rebuilding evaluation				
<b>B</b>	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is <b>evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .	There is <b>strong evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is highly likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The reference point uses sCPUE as an indicator and this is collected and reported annually, so the effectiveness of the strategy in rebuilding the stock will be readily monitored. Together with other monitored indicators (a fisheries independent survey (FIS) for recruitment and mean catch weight) this will allow evaluation of the effectiveness of the rebuilding strategy; thus, meeting SG 60.

The rebuilding strategy provides clear tools for ensuring that management controls are adjusted to keep the strategy to the specified timeframe. During Step 1 of the recovery, if the performance indicator (PI) has declined further an additional catch reduction of 50-100% is required. During Step 2 any TACC increases will require stock assessment modelling that indicates that the catch increase will allow recovery to be achieved within the specified timeframe.

During Step 1 the recovery plan is not explicit about the method for setting the TACC within the nominated range or the process by which these are derived. However, past experience has shown that

these are set with appropriate level of precaution and using tools such as the assessment models that have been developed to ensure the rebuilding strategy remains on track. The continued closure of the Augusta sub-area demonstrates a willingness to set conservative TACCs if required.

Simulation modelling has been conducted of the probability of the reference points being breached, given assumptions of recruitment and natural mortality which indicate very low risk at current catch. Whilst initial simulation modelling had indicated a very low probability of breaching reference points, this occurred in one area in 2019, however as predicted by the modelling, sCPUE increased in both areas in 2020; providing evidence that rebuilding is occurring. The combination of empirical evidence of rebuilding coupled with simulation modelling meets the requirements of SG80.

As there has been only a single year of sCPUE increases this does not constitute strong evidence of recovery. Furthermore, whilst modelling has been conducted to indicate that it is likely that the rebuilding strategy is likely to work, this is based only on area 3 and on recruitment assumptions that may not hold given the history of substantial recent environmental change. The latter was considered in an extreme case (ongoing annual recruitment at the lowest observed historic level) and the rebuilding strategy was found to allow recovery, however not to target levels in the required time frame. The present modelling work is insufficient to indicate a high likelihood of the rebuilding strategy working. Thus, there is neither strong evidence or sufficiently detailed and positive modelling results to meet the requirements of SG100.

References

DPIRD (2020a) Western Australian Abalone Resource Area 3 Greenlip Abalone Recovery Strategy, in DPIRD 2022.

DPIRD (2022). Abalone Resource of Western Australia Harvest Strategy 2021-2026, Version 2.0, Fisheries Management Paper No. 283. Department of Primary Industries and Regional Development, State of Western Australia, 52pp.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 1.1.3 – Genetics outcome

<b>PI 1.1.3</b>	<b>The fishery has negligible discernible impact on the genetic structure of the population</b>		
Scoring Issue	SG 60	SG 80	SG 100
<b>a</b>	Genetic impact of enhancement activity		

	Guide post	The fishery is <b>unlikely</b> to impact genetic structure of wild populations to a point where there would be serious or irreversible harm	The fishery is <b>highly unlikely</b> to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	An independent peer-reviewed scientific assessment confirms with a <b>high degree of certainty</b> that there are no risks to the genetic structure of the wild population associated with the enhancement activity.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The abalone farming operation is not an attempt to enhance the wider stock or the fishery, rather it is an attempt to grow out hatchery produced juveniles within a farm lease. The lease is in open water with abalone placed on ABITATS. There is potential for larvae produced by these ongrown abalone to settle on natural reef in the region. This risk also exists with abalone grown on land-based farms also (not present here) where effluent water is released back into the sea.

This operation is unlikely to impact the wild genetic structure because the broodstock lines are taken from natural reef in the Augusta area where the farm is located (OGA 2018) and the biomass level is thought to be low compared to the genetically distinct population in which the farm is located (the Westerly most genetically distinct population Figure 3; Sandoval-Castillo et al. 2016). Farmed abalone are also harvested at a smaller size than the wild population, including below the size of maturity, hence the spawning potential of the WAEGAF population is low for its biomass. These aspects provide sufficient confidence to meet the requirements of SG60.

Broodstock numbers are managed by government policy to ensure diversity of progeny (Webster et al. 2017). However, there is limited evidence of active implementation of this policy or that consideration has been given to potential impacts as the activity has increased in scale. Hybrid or polyploid abalone are not seeded onto the artificial structures, however some of the initial intent in Hart et. al. 2017 and Webster et al. 2017 was to seed only F1 generation abalone and this restriction is no longer in place with more recent policy indicating that selective breeding of broodstock lines may be possible (DoF 2017a). The WAEGAF has indicated that future intent is to return to using broodstock lines that are closer to F1 generation abalone from local populations. The main factor preventing this to date has been practicalities around the hatchery operation which are likely to resolve in the near future. However, the WAEGAF operation does not have a clear policy, plan or objectives around this aspiration. Nevertheless, the existence of the governmental policy, its implementation and the use of broodstock lines developed from the local region, coupled with the scale of the operation in the context of the size of the genetically distinct population and the small harvest size are sufficient to satisfy SG80.

An independent peer-reviewed scientific assessment determined with a high degree of certainty that the impacts of the abalone hatchery and sea ranch on the genetic structure of wild populations have negligible risk (Webster et al. 2017). However, this was a very broad assessment which only briefly assessed this aspect. Furthermore, it made assumptions that have since been violated including that only F1 generation abalone are used. Consequently, the risk assessment requires updating and even if updated may be too superficial to meet the requirements of SG100. The risk was considered as part of an ecological risk assessment process for the overall fishery resulting in a negligible risk, however this was based on limited evidence and was insufficient to provide the level of certainty required here. Hence SG100 is not met.

References

DoF (2017a). Abalone Aquaculture in Western Australia. Principles and considerations relating to management of abalone aquaculture in WA. Fisheries Occasional Publication No. 132.

DPIRD (In preparation). Ecological risk assessment – Abalone Resource. Report of risk assessment workshop conducted on 21/10/21. Department of Primary Industries and Regional Development, Western Australia

Hart, A.M., Strain, L., Hesp, A., Fisher, E., Webster, F., Brand-Gardner, S., Walters, S. (2017). Marine Stewardship Council Full Assessment Report Western Australian Abalone Managed Fishery. Report No. 8

OGA (2018) Aquaculture Management and Environmental Monitoring Plan (MEMP)

Sandoval-Castillo, J., Robinson, N., Strain, L.W.S., Hart, A.M., Beheregaray, L.B. 2016. Stock enhancement in Greenlip Abalone) Population Genomics. *In: Bioeconomic evaluation of commercial-scale stock enhancement in abalone*, eds. A.M. Hart and L.W.S. Strain, *Fisheries Research Report 269*, Department of Fisheries, Western Australia, 148 pp.

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au)

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<p><b>More information sought</b></p> <ul style="list-style-type: none"> <li>• Clear documentation of broodstock used over time. Including confirmation or otherwise that only F1 generation have been seeded (as indicated in Hart et. al. 2017 and Webster et al. 2017).</li> <li>• Clarification on whether use of F2 or selective breeding is allowed; and if not which policy/licence condition etc. forbids each of these or if they are not used by voluntary agreement.</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

### PI 1.2.1 – Harvest strategy

<b>PI 1.2.1</b>		<b>There is a robust and precautionary harvest strategy in place</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Harvest strategy design			
	Guide post	The harvest strategy is <b>expected</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <b>work together</b> towards achieving stock	The harvest strategy is responsive to the state of the stock and is <b>designed</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.

		management objectives reflected in PI 1.1.1 SG80.		
	Met?	Yes	Yes	Yes

**Rationale**

As noted in PI 1.1.1 the population inside the lease did not exist prior to the commencement of the enhancement activity. Consequently, the harvest decisions from this site are at the discretion of commercial decisions and do not affect the achievement of the stock management objectives indicated in PI 1.1.1 and thus the scoring for this PI is focussed on the harvest strategy for the broader stock.

The new 2021-2026 harvest strategy (DPIRD 2022) for the overall stock is in the final stages of a review. Many elements of the updated harvest strategy are already in place, consequently the draft harvest strategy will be assessed here. The harvest strategy responds to decline in standardized catch rate by lowering the TACC as this proxy for biomass declines, this process is undertaken on an annual basis. The harvest strategy is also strongly reliant on the protection of the legal minimum size limit for greenlip abalone. For an abalone species the combination of conservative size limits and responsive TACs are likely to achieve the stock management objectives reflected in PI 1.1.1 SG80. Consequently, SG60 is met for this PI.

The harvest strategy includes conservative size limits, coupled with a TACC set on the basis of a robust assessment and supported by ancillary indicators including a fisheries independent survey. The reference points against which stock status is evaluated and the sustainable harvest levels (SHL) used for TACC setting are based on recent model based MSY assessments. This provides a sophisticated TACC setting process. The TACC is then implemented through an ITQ system which is supported by a well-developed compliance regime ensuring that the TACC is not exceeded.

The substantial reductions that have occurred in greenlip abalone TACCs in response to environmentally induced declines demonstrates the responsiveness to the stock state. This has been further supported through the development of a recovery strategy as required by the harvest strategy.

The harvest strategy is clearly responsive to the state of the stock and the elements described clearly work together towards achieving the stock management objectives reflected in PI 1.1.1 SG80. Consequently, SG80 is met.

In reviewing the harvest strategy, past experience has been combined with a model-based approach to produce a refined harvest strategy that is designed to achieve the stock management objectives reflected in PI 1.1.1 SG80. The stock is not currently at those levels due to environmental impacts; however, the strategy is designed to achieve those objectives in the required timeframes. Consequently, SG100 is met.

**B Harvest strategy evaluation**

	Guide post	The harvest strategy is <b>likely</b> to work based on prior experience or plausible argument.	The harvest strategy may not have been fully <b>tested</b> but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been <b>fully evaluated</b> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Based on simulation testing and the protection afforded to spawning biomass by the size limit, the harvest strategy is likely to work outside of the influence of major environmental fluctuations resulting in recruitment failure as experienced after the 2011 heat wave. This meets the requirements of SG60.

The sustainability objective in the harvest strategy (DPIRD 2022) relating to the target species is:

*"To maintain spawning stock biomass of each target species (i.e., Roe's, Greenlip and Brownlip abalone) at a level where the main factor affecting recruitment is the environment."*

The stock declines that have taken place since the initial heat wave are due primarily to environmental factors. The rapid reduction of the TACC and the conservative size limits have ensured that the harvest strategy has achieved this sustainability objective. Consequently, SG80 is met.

A full evaluation of the harvest strategy has not been conducted. Also, whilst the harvest strategy mentions the WAEGAF activity as one of the activities taking place on the stock, it does not explicitly indicate whether this is in scope of the harvest strategy. As discussed in PI 1.2.4, inclusion of this biologically connected activity might be necessary and form part of a full evaluation of the harvest strategy. As the harvest strategy has not been fully evaluated and the stock has not been maintained at target levels SG100 is not met.

Harvest strategy monitoring				
<b>C</b>	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	<b>Yes</b>		
Rationale				

The broader stock is assessed through annual analysis of standardised CPUE, mean weights and a fisheries independent survey. The standardised CPUE is the primary indicator which is compared against limit, threshold and target reference points to assess whether the harvest strategy and recovery plan are working as intended. This meets the requirements of SG60.

Harvest strategy review				
<b>D</b>	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			<b>Yes</b>

Rationale

The harvest strategy was implemented in 2016 with a lifespan of 2016-2021 (DoF 2017). The revised harvest strategy (DPIRD 2021) is nearly implemented and contains substantial improvements. The development of the associated resource recovery plan (DPIRD 2020a) is a further example of DPIRD improving the harvest strategy as necessary. Together this meets the requirements of SG100.

Shark finning

E	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

Rationale

Scoring issue not scored as sharks are not a target species in this UoA.

Review of alternative measures

F	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

Rationale

Scoring issue not scored as there is no unwanted catch of the target stock.

References

DoF (2017). Abalone Resource of Western Australia Harvest Strategy 2016-2021, 36pp.

DPIRD (2020a). Western Australian Abalone Resource Area 3 Greenlip Abalone Recovery Strategy, in DPIRD 2022.

DPIRD (2022). Abalone Resource of Western Australia Harvest Strategy 2021-2026, Version 2.0, Fisheries Management Paper No. 283. Department of Primary Industries and Regional Development, State of Western Australia, 52pp.

**Draft scoring range**

**≥80**

Information gap indicator

**More information sought**

- Any available information regarding the harvest strategy for WAEGAF abalone.
- Clear information detailing the calculation of the SHLs and RPs in the new harvest strategy.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	<b>NA</b>

PI 1.2.2 – Harvest control rules and tools

<b>PI 1.2.2</b>		<b>There are well defined and effective harvest control rules (HCRs) in place</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	HCRs design and application			
	Guide post	<b>Generally understood</b> HCRs are in place <b>or available</b> that are <b>expected</b> to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	<b>Well defined</b> HCRs are <b>in place</b> that <b>ensure</b> that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock <b>fluctuating around</b> a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock <b>fluctuating at or above</b> a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, <b>most</b> of the time.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

As noted in PI 1.1.1 the population inside the lease did not exist prior to the commencement of the enhancement activity. Consequently, the harvest decisions from this site are at the discretion of the WAEGAF’s commercial decisions and expected to keep the WAEGAF population fluctuating around a target level consistent with MSY. However, the HCRs as applied to the broader fishery are less certain in their capacity to achieve this and the scoring for this PI is thus focussed on the harvest control rule for the broader stock.

The harvest control rule reduces catch as the performance indicator of sCPUE falls below the threshold reference point and approaches the limit reference point. The fishery thus meets SG60.

Under the previous HCR there was an unexpected ongoing decline in stocks and sCPUE through to 2019 which indicates that the HCR was not sufficiently robust to meet SG80. A new HCR has been developed and is part of the new harvest strategy (DPIRD 2022). This HCR is based on extensive modelling which develops reference points and sustainable harvest levels on the basis of  $B_{MSY}$  and MSY. This sets more precautionary reference points that based on performance in other fisheries can be expected to keep the stock fluctuating around a target level consistent with MSY (after rebuilding). The annual TAC is set within the range obtained from comparison of sCPUE against the reference points. The level of catch set within this range depends on the outcome of a weight of evidence assessment. This assessment includes secondary indicators of meat weight and length frequency (fisheries dependent and independent) and combines these through multiple modelling approaches including a length-based integrated assessment model for Area 3.

A primary indicator exists which is compared against consistent and precautionary reference points to set a TACC range. This ensures that the exploitation rate is reduced as the PRI is approached. The TACC value within this range is set on the basis of a weight of evidence approach that utilises a broader range of indicators and assessment methods. This meets the requirements of SG80.

The HCR implements catch at higher levels of stock abundance that have historically prevented the stock staying above the target reference point most of the time, therefore not meeting SG100.

HCRs robustness to uncertainty				
<b>B</b>	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a <b>wide</b> range of uncertainties including the ecological role of the stock, and there is <b>evidence</b> that the HCRs are robust to the main uncertainties.
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The revised HCR is based on application of several modelling approaches to determine appropriate sustainable harvest levels (SHLs). These modelling approaches have given broadly consistent estimates of  $B_{MSY}$ , showing that the HCR is robust to the modelling approach used to derive a key parameter on which it is based.

Modelling has been done to examine the performance of the HCR and recovery strategy under reduced recruitment (arguably the main uncertainty in this fishery, given the recent heat wave). This showed that recovery to sustainable levels would occur but recovery to the target would require deviation from the HCR – this is as robust as could reasonably be expected for a HCR when faced with the extreme low recruitment scenario that was tested.

The primary indicator used by the HCR is the standardised CPUE (sCPUE) index which involves standardisation or correction for the main uncertainties including month, subarea, diver and technological improvement. In dive fisheries the sCPUE can exhibit non-linearities due to diver behavioural elements (see also PI 1.2.3(b), 1.2.4(b)). To support the index secondary indicators of meat weight and length frequency (fisheries dependent and independent) are used and combined through multiple modelling approaches including a length-based integrated assessment model for Area 3.

Overall, the HCR was developed using a process that is robust to a range of model uncertainty through the use of multiple approaches and has been tested against a key source of uncertainty. This meets SG80.

A wider range of uncertainties could be considered (e.g., consideration of fleet dynamics impact on CPUE at current low catch levels). The HCR is based on extensive modelling and a sound rationale, together this indicates it is likely to be robust to the main uncertainties, however this does not constitute evidence that it is. Consequently, SG100 is not met.

<b>C</b> HCRs evaluation				
Guide post	There is <b>some evidence</b> that tools used <b>or</b>	<b>Available evidence indicates</b> that the tools	<b>Evidence clearly shows</b> that the tools in	

	<b>available</b> to implement HCRs are appropriate and effective in controlling exploitation.	in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	use are effective in achieving the exploitation levels required under the HCRs.
Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale			

There is evidence that controls on catch are effective in achieving required exploitation rates, as evidenced by stability in the fishery prior to 2010. The fishery thus meets SG60 and SG80. There is not yet clear evidence that the HCR has been sufficiently responsive to restore sCPUE following the heatwave-induced decline from 2010. Hence the fishery does not meet SG100.

References

DoF (2016) Abalone Resource of Western Australia Harvest Strategy 2016-2021, 36pp.

DPIRD (2022) Fisheries Management Paper No. 283: Abalone Resource of Western Australia Harvest Strategy 2021-2026, Version 2.0, 52pp.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<p><b>More information sought</b></p> <ul style="list-style-type: none"> <li>Any available information on harvest decisions in WAEGAF (e.g., intended stocking levels, fishing to market, likely variability in egg production from one year to the next).</li> <li>Detailed rationale for the percentages applied to the SHL for the different RP ranges.</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 1.2.3 – Information and monitoring

<b>PI 1.2.3</b>		<b>Relevant information is collected to support the harvest strategy</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Range of information			
	Guide post	<b>Some</b> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	<b>Sufficient</b> relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A <b>comprehensive range</b> of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be

				directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	No
Rationale				

Biological information and assessment approaches for greenlip abalone are available from other jurisdictions and this has been utilized where relevant. The harvest strategy for the broader stock (DPIRD 2022) primarily relies on sCPUE which is collected through compulsory logs. Testing of the HCR relied on additional available information such as onset of maturity. Monitoring of recruitment is of value for interpreting trends in the stock. The WAEGAF activity has maximum stocking densities specified as a licence condition, this is assessed through annual biomass density surveys. Collectively, the available information is sufficient to support the harvest strategy and thus SG80 is met.

However, the information is not comprehensive. The dynamics of the population decline in recent years remain poorly understood. Fleet dynamics can substantially influence abalone CPUE and remains relatively unstudied in this fishery. Information on stock structure which is of great importance for abalone fisheries remains limited. In particular, the connection to the WAEGAF population and its potential importance for recruitment to the broader region remains unclear. The lack of important information including these factors means that SG100 is not met.

Monitoring				
B	Guide post	Stock abundance and UoA removals are monitored and <b>at least one indicator</b> is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are <b>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</b> , and <b>one or more indicators</b> are available and monitored with sufficient frequency to support the harvest control rule.	<b>All information</b> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent <b>uncertainties</b> in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes	Yes	No
Rationale				

The harvest strategy is designed to use data that has been collected for several years and is monitored through an ongoing compulsory log program. This includes a key indicator – sCPUE – as well as other indicators such as meat weight and the fisheries independent survey. Recreational catch is also monitored through surveys that are sufficiently regular for the purposes of the harvest strategy. This is sufficient to support the harvest control rule, thereby meeting SG60 and SG80.

Standardised CPUE for abalone fisheries is known to be difficult to assess due in part to divers’ ability to modify behaviour in response to low abundance to maintain higher CPUE. This is exacerbated with current low TACs as divers indicated other behavioural changes in fishing practices that cannot readily be accounted for in the CPUE standardisation (see also PI 1.2.2(b) and 1.2.4(b)). Consequently, there is some uncertainty in the primary indicator used by the HCR that has not been accounted for. Consequently, SG100 is not met.

Comprehensiveness of information			
<b>C</b>	Guide post	There is good information on all other fishery removals from the stock.	
	Met?	<b>Yes</b>	
Rationale			

All commercial catch is monitored in high detail with high precision. Recreational catch is relatively minor, <5% and collected regularly through telephone and integrated surveys (these involve an off-site phone diary survey, on-site boat ramp surveys and a remote camera survey). Greenlip abalone across the whole Western Australian fishery has previously been indicated to have a non-negligible illegal market and this has been estimated as well as possible at 3 t. Illegal catch in the WAEGAF lease is thought to be negligible/non-existent due to the high staff presence within the lease site. This meets SG80.

References

DPIRD (2022). Abalone Resource of Western Australia Harvest Strategy 2021-2026, Version 2.0, Fisheries Management Paper No. 283. Department of Primary Industries and Regional Development, State of Western Australia, 52pp.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>More information sought</b> <ul style="list-style-type: none"> <li>Any information regarding illegal removals from the WAEGAF population.</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?	<b>Yes</b>		<b>Yes</b>
Rationale				

The assessment and application to the HCR for the broader stock is primarily focused on sCPUE as this is the basis for the HCR. It is known that for abalone dive fisheries sCPUE can exhibit stability due to diver compensatory behaviour and other changing fishing practices (see also PI 1.2.2(b) and PI

1.2.3(b)). However, consistency with secondary indicators including through integrated stock assessment approaches (DPIRD in prep) demonstrates that a CPUE-based assessment remains appropriate for the stock.

A range of assessment approaches were investigated and used with the sCPUE index. This includes integrated length-based assessment models that utilise fishery dependent and fishery independent survey data (DPIRD, *In prep.*). This work has been used to develop the reference points against which sCPUE is compared and shown that the index is consistent with other datasets. So, whilst the primary indicator, sCPUE, is not based on these modelling approaches they provide a benchmark against which to compare this indicator and demonstrate its consistency with other datasets. The modelling approaches also contribute to the weight of evidence assessment that is used to set the TACC within the ranges indicated by sCPUE.

sCPUE has some issues for abalone dive fisheries, however it is widely used in abalone fisheries and is supported by additional data sources, secondary indicators and assessment approaches in this fishery. This meets the requirements of SG80.

The assessment also considers a range of other major features relevant to the biology of the species. These include variation in recruitment with information from independent surveys and the size structure of the catch which is sampled by the commercial fishers. These have been utilised in an integrated assessment which has supported the development of the harvest strategy and rebuilding plan. The fishery thus meets SG100.

Assessment approach			
<b>B</b>	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.
	Met?	<b>Yes</b>	<b>Yes</b>
Rationale			

Reference points for sCPUE have been developed for the fishery based on integrated model-based assessments. The threshold reference point is set at  $B_{MSY}$  and the limit reference point at  $0.5B_{MSY}$ . These levels are appropriate for this species and are routinely evaluated as sCPUE is the primary indicator. This meets SG60 and SG80.

Uncertainty in the assessment				
<b>C</b>	Guide post	The assessment <b>identifies major sources</b> of uncertainty.	The assessment <b>takes uncertainty into account.</b>	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a <b>probabilistic</b> way.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The assessment identifies major sources of uncertainty including environmental impacts, the variable relationship of CPUE to abundance, population structure and the impact of fisher behaviour. Thus, meeting SG60.

Reference points are based on sCPUE with uncertainty estimated and reported as confidence limits. The process of standardization is intended to reduce the influence of known factors affecting CPUE such as weather prediction. The fishery thus meets SG80.

A probabilistic analysis of reference points has been conducted that includes estimates of uncertainty around inputs where possible (such as growth). However, the assessment simply compares the estimated sCPUE against the RP, rather than a precautionary percentile or some other approach that explicitly considers the level of uncertainty inherent in a particular sCPUE estimate. Consequently, it cannot be said that reference points are evaluated in a probabilistic manner and SG100 is not met.

Evaluation of assessment			
<b>D</b>	Guide post		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		<b>Yes</b>
Rationale			

The assessment uses a range of data and modelling approaches. The modelling supporting the new harvest control rule and harvest strategy has demonstrated that several approaches including Catch-MSY, a Schaefer production model, a length-based catch curve analysis and integrated assessment have produced similar and consistent results. A weight of evidence approach has been used to integrate these findings (DPIRD, *in prep.*).

This demonstrates that alternative hypotheses have been rigorously explored and the assessment is robust to these. Consequently, SG100 is met.

Peer review of assessment			
<b>E</b>	Guide post	The assessment of stock status is subject to peer review.	The assessment has been <b>internally and externally</b> peer reviewed.
	Met?	<b>Yes</b>	<b>No</b>
Rationale			

The assessment is subject to annual internal review through the process of status reporting for the jurisdiction. This meets SG80.

It has previously been indicated that independent external review occurs through a process of periodic reviews commissioned by the Department of Fisheries and to a lesser extent for export approval by the Commonwealth Government. However, reviews have not been recently conducted and SG100 is not met.

References

Hart, A.M., Strain, L., Hesp, A., Fisher, E., Webster, F., Brand-Gardner, S., Walters, S. (2017). Marine Stewardship Council Full Assessment Report Western Australian Abalone Managed Fishery.

DPIRD (*In prep.*) Abalone Resource Assessment Report, Department of Primary Industries and Regional Development.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>More information sought</b> Details on the external reviews are required for SI e.

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>90</b>
Condition number (if relevant)	<b>NA</b>

### PI 1.2.5 – Genetics management

PI 1.2.5		There is a strategy in place for managing the hatchery enhancement activity such that it does not pose a risk of serious or irreversible harm to the genetic diversity of the wild population		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Genetic management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, which are expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a <b>partial strategy</b> in place, if necessary, which is expected to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).	There is a <b>strategy</b> in place to maintain the genetic structure of the population at levels compatible with the SG80 Genetic outcome level of performance (PI 1.1.3).
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

A range of policies and management measures exist to ensure that hatchery and farming activity do not pose a risk of serious or irreversible harm to the genetic diversity of the wild population. This includes the FRMA 1994, the FRMR 1995 and Abalone Aquaculture in Western Australia (DoF 2017). These policies have resulted in licence conditions on the operator which are expected to maintain the genetic structure at levels compatible with SG80 of PI 1.1.3, in particular the use of broodstock lines originating from Augusta and a limit on the maximum scale of the operation. This meets the requirements of SG60.

The measures in place are derived from a broader policy framework including a document specifying the overarching “Principles and considerations relating to management of abalone aquaculture in Western Australia” (DoF 2017). Consequently, this can be considered a partial strategy which is sufficient to meet SG80.

The Abalone Aquaculture in Western Australia (DoF 2017) policy and Hart et al. 2017 lists genetic principles relating to broodstock collection and maintenance, spawning management procedures, distance of sea ranching operation from significant wild stocks, potential spawning biomass of sea

ranching animals and compliance procedures. These measures were considered in the independent review described in PI1.1.3. There are some differences between the policy in DoF 2017, the nature of the operation assessed in the risk assessment (Webster et al. 2017) and described in Hart et. al. 2017 (including the seeding of F2 abalone on to the ABITATS). Beyond the previously mentioned licence conditions it is unclear which elements of this policy and the assumptions included in the risk assessment are actively used as a strategy for managing the WAEGAF. However, those elements that are clearly in place include the separation of the sea ranching activity from wild stock, the limitation on the overall activity size, the origin of the broodstock, compliance checks and reporting measures. Together these elements constitute a partial strategy which is clearly in place and meets the requirements of SG60 and SG80.

However, the strategy is not fully in place as some elements are not implemented (e.g., monitoring of mature biomass and contrasting with the population in the broader region) and is only a partial strategy as there are multiple contradictory elements (e.g., whether F2 or selected broodstock lines are permitted, hence SG100 is not met).

Genetic management strategy evaluation				
<b>B</b>	Guide post	The measures are considered <b>likely</b> to work based on plausible argument (e.g. general experience, theory, or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the partial strategy will work based on information directly relevant to the population(s) involved.	The strategy is based on <b>in-depth knowledge</b> of the genetic structure of the population, and <b>testing</b> supports <b>high confidence</b> that the strategy will work.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

There is an understanding of the coarse genetic structure of Greenlip abalone populations (Sandoval-Castillo et al. 2018) in WA. This provides information to assess effects of farming and to assess validity of strategies used to manage risk. Coupled with locally sourced broodstock lines and the dispersal distances of abalone and the physical separation of the lease from existing habitat are likely to work. This meets SG60.

There is insufficient knowledge of abalone larval dispersal to give an indication of the likely linkages to nearby reefs and consequently the potential for the WAEGAF population to affect genetic structure of nearby populations. This is more relevant in recent years as the broader Augusta abalone population has declined to record lows and the WAEGAF population biomass has increased to 229 t (DPIRD 2020b).

As described in Hart et al. 2017, potential effects on wild stocks were planned to be assessed by conducting periodic spawning biomass surveys of each sea-ranching facility. These were planned to provide estimates of the spawning biomass of cultured populations relative to existing wild populations. It was anticipated that when spawning biomass of cultured populations in sea ranching operations reached a large enough proportion, e.g., 10% or more of wild populations, more in-depth genetic monitoring would be undertaken, including on-going monitoring of the diversity of wild stocks.

Biomass surveys have been undertaken (e.g., DPIRD 2020b) however they have only been used to assess the stocking density for a licence condition and have not been used to assess the populations involved as anticipated in Hart et al. 2017.

Consequently, crucial information directly related to the populations involved is missing and hinders the ability to assess the partial strategy as required by SG80. Hence SG80 is not met.

Genetic management strategy implementation			
C	Guide post		There is <b>some evidence</b> that the partial strategy is being implemented successfully, if necessary.
			There is <b>clear evidence</b> that the strategy is being <b>implemented successfully</b> . There is some evidence that the strategy is <b>achieving its overall objective</b> .
	Met?	Yes	No
Rationale			

Monitoring of the current operation provides clear evidence that the partial strategy is being implemented, thus meeting SG80.

It is unclear what the overall strategy entails as it appears to have deviated from what was described in Hart et al. 2017 and DoF 2013. Consequently, there is no clear evidence that the strategy is being successfully implemented. Furthermore, no direct or indirect evidence is available to illustrate that it is achieving its objective. Hence SG100 is not met.

### References

Fish Resources Management Act 1994 (FRMA).

Fish Resources Management Regulations 1995 (FRMR).

DoF (2017a). Abalone Aquaculture in Western Australia. Principles and considerations relating to management of abalone aquaculture in WA. Fisheries Occasional Publication No. 132.

DPIRD (2020b) 2020 Ocean Grown Abalone – Biomass Survey, 8pp

Hart, A.M., Strain, L., Hesp, A., Fisher, E., Webster, F., Brand-Gardner, S., Walters, S. (2017). Marine Stewardship Council Full Assessment Report Western Australian Abalone Managed Fishery.

Sandoval-Castillo J., Robinson N.A., Hart A.M., Strain L.W.S., and Beheregaray L.B. (2018). Seascape genomics reveals adaptive divergence in a connected and commercially important mollusc, the greenlip abalone (*Haliotis laevis*), along a longitudinal environmental gradient. *Molecular Ecology*, 27(7): 1603-1620.

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au).

Draft scoring range	<b>60-79</b>
Information gap indicator	<p><b>More information sought</b></p> <ul style="list-style-type: none"> <li>Have spawning biomass estimates been produced from the surveys and comparisons been made to wild populations?</li> </ul>

- A clearly articulated genetic strategy for WAEGAF?
- How does DoF reconcile contradictory elements within the listed policies and guidelines?

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>2</b>

PI 1.2.6 – Genetics information

PI 1.2.6		Information on the genetic structure of the population is adequate to determine the risk posed by the enhancement activity and the effectiveness of the management of genetic diversity		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	<p><b>Qualitative or inferential information</b> is available on the genetic structure of the population</p> <p>Information is <b>adequate</b> to broadly understand the likely impact of hatchery enhancement.</p>	<p><b>Qualitative or inferential information and some quantitative information</b> are available on the genetic structure of the population.</p> <p>Information is <b>sufficient</b> to estimate the likely impact of hatchery enhancement.</p>	<p>The genetic structure of the population is understood in <b>detail</b>.</p> <p>Information is <b>sufficient</b> to estimate the impact of hatchery enhancement with a <b>high degree of certainty</b>.</p>
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The coarse scale genetic structure of abalone populations within WA is well understood (Sandoval-Castillo et al. 2018) as well as the broader structure across the full biological range of the species (Mayfield et al. 2014). This shows that dispersal is extensive compared to many abalone species so that it is likely that dilution of any hatchery impact will occur. This meets the requirements of SG60.

The information on genetic structure is quantitative and coupled with the measures in place for managing the broodstock lines enables the likely impact of the WAEGAF to be estimated. Thus, meeting SG80.

The genetic structure of the population is not understood in detail. The impacts of the current scale of the WAEGAF operation have not been quantitatively considered, particularly in the context of a wild population with a low population size. Consequently, the impact of the hatchery enhancement cannot be estimated with a high degree of certainty and SG100 is not met.

		Information adequacy for genetic management strategy		
<b>b</b>	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a <b>partial strategy</b> to manage the <b>main</b> genetic impacts of the enhancement activity on the stock, if necessary.	Information is adequate to support a <b>comprehensive strategy</b> to manage the genetic impacts of the enhancement activity on the stock and evaluate with a <b>high degree of certainty</b> whether the strategy is achieving its objective.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The partial strategy described in PI 1.2.5 requires information on dispersal distances, stock structure, habitat location and genetic characteristics of abalone. All of these elements have been well studied with sufficient information available to support the partial strategy. Thus, meeting SG60 and SG80.

Whilst a comprehensive strategy does not exist, such a strategy would likely require substantial additional information. Including estimates of spawning biomass in the WAEGAF population, a finer understanding of the population structure and estimates of the likely impact of larval supply from the WAEGAF population on the nearby diminished wild populations. Consequently, SG100 is not met.

References

Mayfield, S., Miller, K.J., and Mundy C.N. (2014). Towards understanding Greenlip abalone population structure. Final report for the Fisheries Research and Development Corporation. Prepared by the South Australian research and Development Institute (Aquatic Sciences), Adelaide. FRDC Project N. 201012. 31pp.

Sandoval-Castillo J., Robinson N.A., Hart A.M., Strain L.W.S., and Beheregaray L.B. (2018). Seascape genomics reveals adaptive divergence in a connected and commercially important mollusc, the greenlip abalone (*Haliotis laevis*), along a longitudinal environmental gradient. *Molecular Ecology*, 27(7): 1603-1620.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

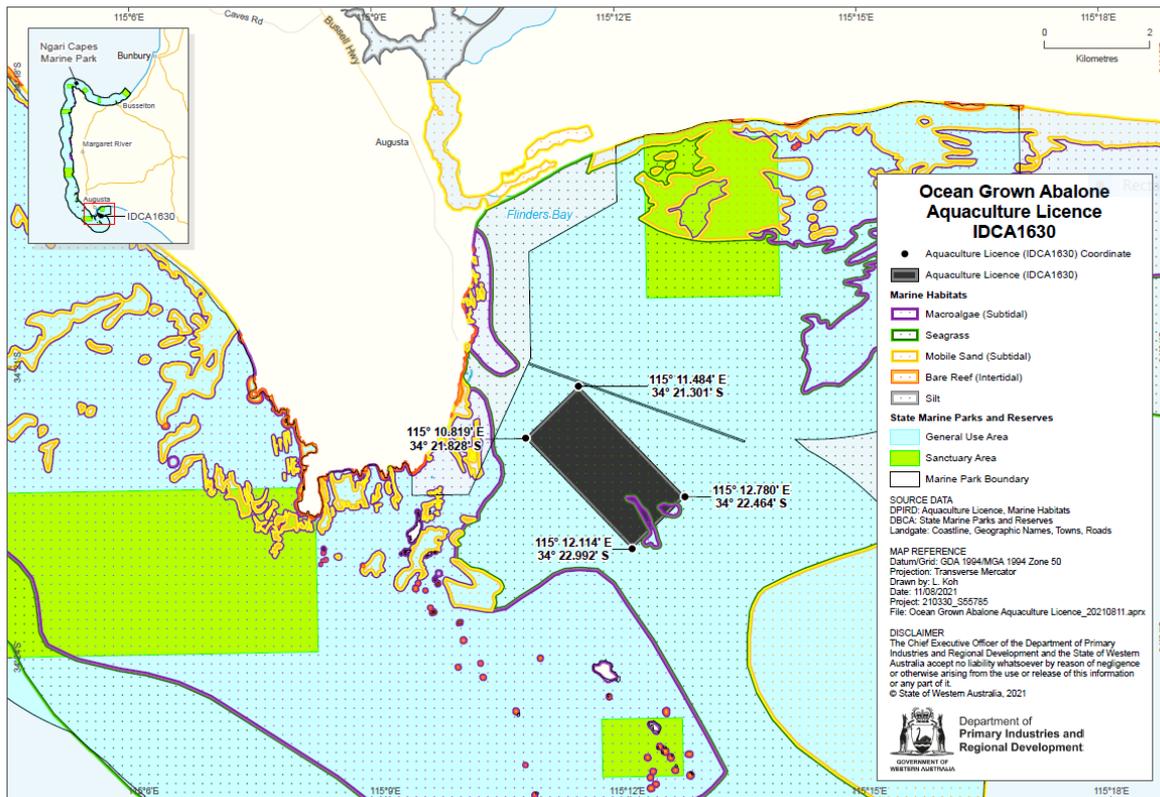
Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

## 7.3 Principle 2

### 7.3.1 Principle 2 background

#### Ecosystem

The lease area for the enhanced abalone fishery is located in Flinders Bay, near Augusta, Western Australia (Figure 8). The lease encompasses 413.3 ha of the sea floor whereas the bay is approximately 19,600 ha. The lease is located in a deeper basin approximately 3.8 km offshore and inside the Ngari Capes Marine Park within the "General Use Zone".



**Figure 8.** Western part of Flinders Bay showing location and GPS coordinates of the WAEGAF Aquaculture Licence IDCA 1630 in Flinders Bay, near Augusta, Western Australia. The area in and around the lease has subtidal macroalgae and sand as well as seagrass further inshore and offshore (DPIRD 2021).

The water depth within the lease area ranges from approximately 15 m (LAT) at the northern end of the lease to 19 m (LAT) towards the lease's most southern extent (Figure 6). Drift algae, dislodged after major storm events are trapped in the deeper basin of the lease area and become available as a food source for the abalone. In sheltered areas around and amongst the "ABITATS" mainly kelp species (*Ecklonia wreck* and *Sargassum* spp.) accumulate which are usually not used as a food source by greenlip abalone. Greenlip abalone (*Haliotis laevis*) prefer red algae and species like *Pollexfenia pedicellate* and *Gracilaria flagelliformis* are found primarily at the site as drift algae and also grow on "ABITATS" (Melville-Smith et al. 2017).

The area east of Flinders Bay is within the path of the Leeuwin Current during autumn and winter. During spring and summer, the Leeuwin Current's southward flow is at its weakest, and it is driven offshore by the onset and persistence of strong south-south-westerly winds. It is replaced closer to the mainland by the northward flowing Capes Current. The Capes Current is a narrow (less than 20 kilometres wide), relatively cold and nutrient rich band of water (Hill & Ryan 2002a).

Flinders Bay coastal water circulation is strongly influenced by the wind and subjected to the heavy swells. Under the prevailing swell conditions, littoral currents move sediments to the east along Flinders Bay (Hill & Ryan 2002).

The current WAEGAF licence (No. 1630) stipulates that greenlip abalone (*Haliotis laevis*) must not be stocked at a density that exceeds a biomass of three kilograms whole weight per square meter of grow-out surface (Licence condition 7) and no more than 15,000 structures (abitats) are to be used at any time and structures must have a total surface area of less than 10 square meters (Licence condition 4).

The WAEGAF licence also lists a sediment quality monitoring program followed according to the WAEGAF's MEMP (Licence condition 9). Biannual sediment surveys were conducted between summer 2015 and winter 2019 (MEMP). Total phosphorus (TP) and nitrogen (TN) and well as total organic carbon (TOC) and sediment redox discontinuity (Redox) was measure 2x per year. The sampling was replicates down current at 1,5, and 10 m intervals from fully stocked "ABITATS" and at reference sites located 50 m from the boundary of the lease. No significant difference in nutrient concentration (nitrogen, phosphorus, organic carbon, redox) was detected at the ABITAT sites compared to reference sites during the five years of monitoring. The monitoring program was amended in 2020 to annual sampling (summer) every 5 years.

Licence condition 8 stipulated that no growth hormones, antibiotics or feed is to be used at the site unless authorized in writing by the Principal Research Scientist Fish Health.

All licence conditions are audited every 6 months. Biomass surveys were conducted annually (2016-2020) and reports were provided to the audit team. Results indicate that total biomass increased from 45 tonnes in 2016 to 229 tonnes in 2020 but was always below the maximum permitted stocking density of 3kg per m<sup>2</sup>.

## Habitat

Flinders Bay main habitats consist of predominantly sand with patches of shallow limestone or granite reef that occur amongst the sparse seagrass beds (Department of Environment and Conservation 2013). Macroalgae are more common than seagrass and can be found on low and high relief limestone. A study conducted at the lease site found a large number of species of drift algae and seagrasses (Melville-Smith et al. 2017). The majority (66 %) were red algae, then brown (22 %) with the remainder comprising seagrass and green algae taxa. Brown algae dominated through the year in terms of their volume as a proportion of the algae and seagrasses sampled, but they dropped off in summer in favour of red algae and seagrasses.

Flinders Bay seagrass communities include *A. antarctica*, *A. griffithii*, *T. pachyrhizum*, *Halophila ovalis* and *Heterozostera nigricaulis*. *T. pachyrhizum* *H. ovalis* and *H. nigricaulis* species are generally ephemeral, and all are sparsely distributed with smaller amounts of perennial seagrasses present.

In sheltered, low relief limestone areas, kelp species like *Sargassum* spp. and *Ecklonia radiata* are dominant (Harman, Harvey and Kendric 2003). Low relief limestone habitat is associated with a wide range of invertebrate life such as ascidians, calcareous sponges and gastropods. High reefs host macroalgae, turf algae, a variety of shell producing molluscs, abalone, crabs, shrimps, barnacles and juvenile reef fish.

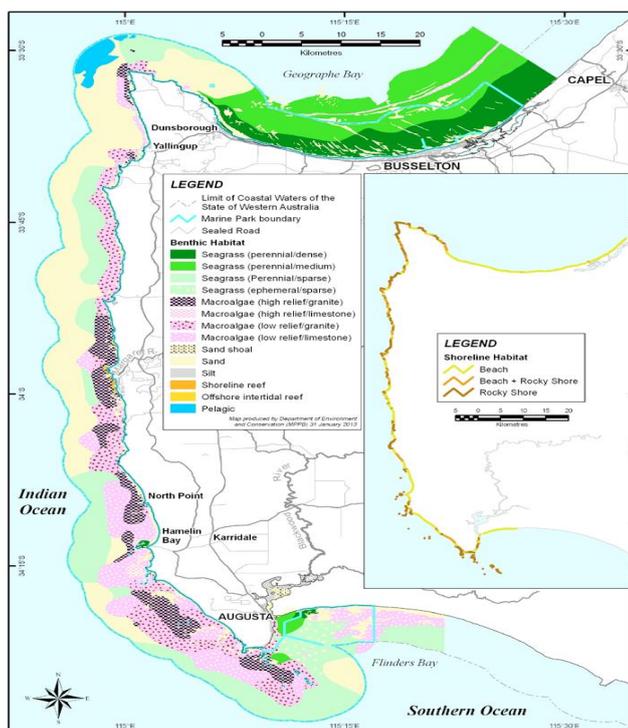
Commonly encountered habitats within Flinders Bay are sand, limestone or granite reef with macroalgae and sponges as well as sparse seagrass (Figure 8). The lease area predominantly consists of sand and limestone reef covered by macroalgae and invertebrates. "ABITATS" are placed on sand and about 1 % of the sandy seabed are covered by these structures within the lease area (EPA 2013). The WAEGAF

MEMP (2020) states that structures will not be placed directly on seagrass but will be deployed on clear sand patches. The photograph below depicts the placement of an "ABITATS" on the ocean floor on sand (Figure 9). Aerial photographs have also been provided by the WAEGAF and overlaid with positions of "ABITATS" (Figure 11). The dark areas are representing reefs, other darker blue areas are drift algae on sand, light areas are clear sandy bottom. As explain in early sections of the Principle 2 background, large amounts of species are found as drift algae at the site around and amongst the "ABITATS" (Melville-Smith et al. 2017).

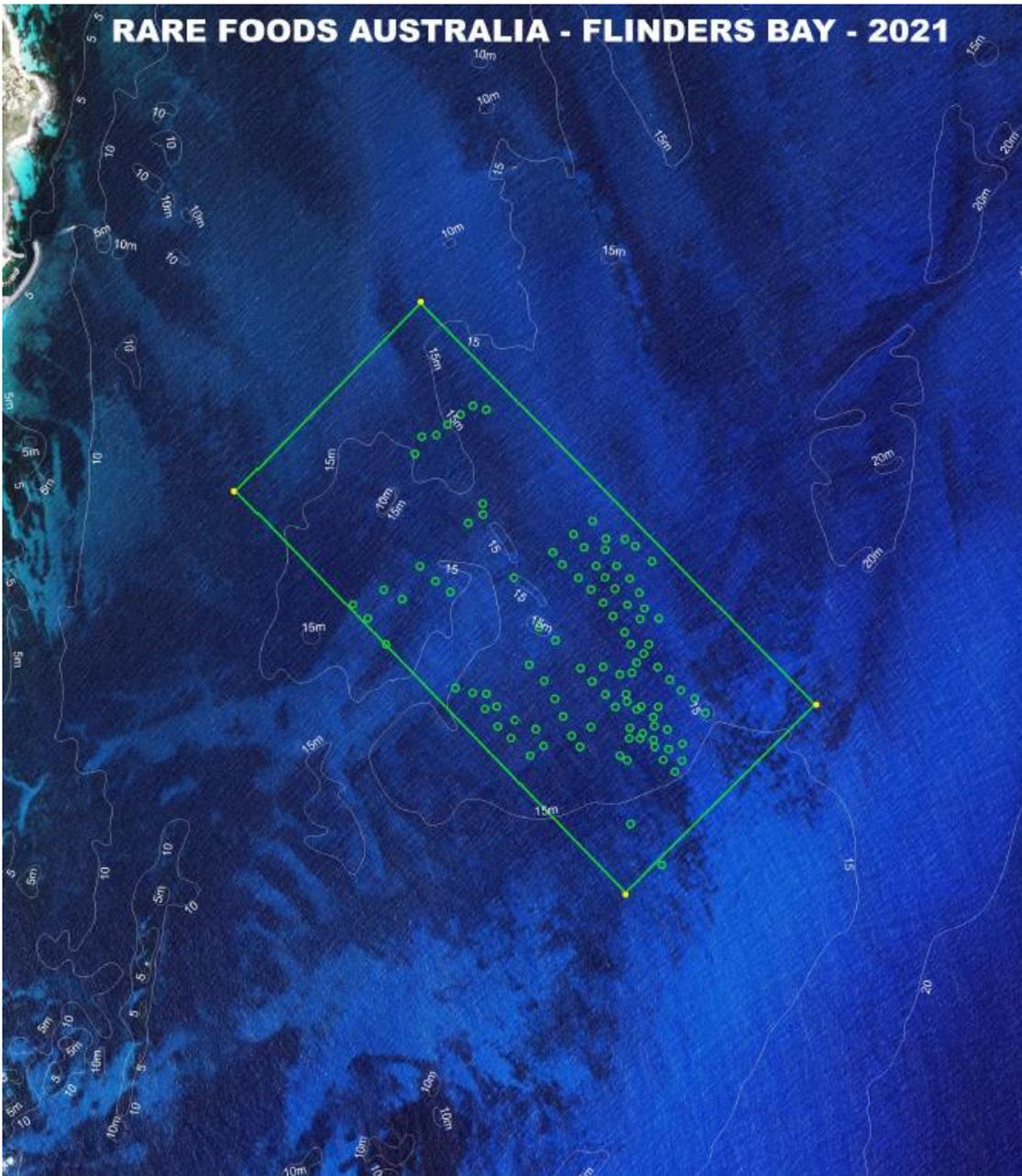
In addition, DPIRD staff conduct annual biomass surveys and observe the placement of the abitats. During the site visit staff were interviewed and confirmed placement on sand only. This has been added as additional confirmation that placement is also monitored and confirmed annually by DPIRD staff.



**Figure 9.** In situ photograph of "ABITATS" being placed on the ocean floor on sand (RFA, 2022).



**Figure 10.** Habitat map of the Ngari Capes Marine Park including Flinders Bay (Source: DEC 2013).



**Figure 11.** Aerial photograph of the WAEGAF lease (green rectangle) in Flinders Bay, Western Australia. Green dots are moorings which are at the terminals of groups of “ABITATS”. Dark blue areas are reefs, other dark blue areas are predominantly drift algae over sand, light areas are clear sandy bottom.

### Vulnerable Marine Ecosystems

There are Vulnerable Marine Ecosystems (VMEs) as defined by the MSC Standard V2.0 (GSA3.13.3.2) that may be impacted upon by the UoA. These are seagrass beds that are known to occur in Flinders Bay (DEC 2013). The WAEGAF lease area for the enhancement activity is inside the General Use Zone of the Ngari Cape Marine Park and away from significant seagrass beds (Figure 10).

The aerial photograph of the WAEGAF lease (Figure 11, green rectangle). Seagrass is sparse and limestone reef is colonised by macroalgae. The dark areas in the aerial photograph are representing reefs, other darker blue areas are drift algae on sand as explained above, light areas are clear sandy bottom. For the purposes of this assessment, seagrass beds were identified as VMEs and are therefore assessed as such (MSC FS GSA3.13.3.2).

## Primary and Secondary Species

In accordance with MSC standard v 2.01 (MSC, 2018);

Primary species are species that;

- are in the catch but not covered under P1 because they are not included in the UoA (SA 3.1.3.1)
- are within scope of MSC program as defined by FCR 7.4 (SA 3.1.3.2) and
- have management tools and measures in place, intended to achieve stock management objectives reflected in either limit or target reference points (SA 3.1.3.3)

Secondary species are species that are;

- not considered "primary" as defined in SA 3.1.3; or
- out of scope for MSC certification (i.e., birds, reptiles or mammals) but are not ETP species.

Main species (Primary or Secondary) are species that;

- comprise 5% or more by weight of the total catch of the UoC (FCR 2.01 SA 3.4.2.1) or
- are classified as 'less resilient' (e.g., sharks) and comprise 2% or more by weight of the total catch (CR 2.01 SA 3.4.2.2).

Therefore, all species that are not assessed under Principle 1 and are managed with reference points are considered "primary" and are considered under PI 2.1.– 2.1.3 while secondary species are assessed under PI 2.2.– 2.2.3.

Due to the highly selective dive assisted "enhanced" fishery with licences specifying that only greenlip abalone can be harvested, there are no primary species caught.

However, predators are removed from the lease area. In the past, Western rock lobster (*Panulirus cygnus*) have been removed from the lease site under an exemption to the Fish Resources Management Act (FRMA) 1994 sections 46 and 98, regulation 12 of the Fish Resources Management Regulations 1995 and condition 15 of the Aquaculture Licence for the WAEGAF (Exemption Number 2871; DoF 2015). The exemption expired on the 31 December 2018. Since 2018, rock lobster are removed using a recreational licence only during a 2-week period in summer, when the lobsters are migrating from shallow waters to deeper waters. The daily bag limit for rock lobster is 8 or 24 per boat. Octopus (*Octopus djinda*) are allowed to be fished by recreational vessels using a recreational fishing licence with a bag limit of 15 octopus or 30 octopus boat limit per day if more than 2 people on board. A more formal longer-term arrangement has not been developed by the management agency DPIRD.

The MEMP states that the regulatory body (DPIRD) has not identified the removal of predators as a sustainability issue and there was no need for monitoring. *Octopus djinda* (*sp. nov.*) populations in the natural abalone habitat will not be adversely affected by the aquaculture activity. Rock lobster removal is not mentioned as part of the MEMP.

Neither rock lobster or octopus removal by divers are recorded by the WAEGAF and there are no reporting requirements to the management authority (DPIRD). Both rock lobster and octopus are considered a primary species for the purpose of the MSC assessment. It is estimated that 25-50 rock lobster (for 2 weeks a year) and 5-10 octopus are removed per week (B. Adams, pers com. February 2022). Data on octopus removals was provided by the WAEGAF for 2016 only and showed 365 individuals per year. Although these removals have not been fully quantified, these species would consist of <5% of the UoA catch, following the MSC guidance SA3.4.4 – 3.4.5 they are therefore considered minor species for the MSC assessment.

Secondary species consist of epibionts found on abalone shells. Such species primarily consists of coralline algae, sponges and small invertebrates as well as seedlings of macroalgae. There are no known

species that solely rely on abalone shells for habitat. Coralline algae, sponges and small invertebrates as well as seedlings of macroalgae frequently grow on the backs of abalone shells as well as surrounding hard surfaces such as granite boulders or limestone reefs. Therefore, it is highly unlikely that the removal of these species by harvesting the abalone from the lease site would have any significant impacts on algae diversity or distribution. These species are considered minor secondary species.

## ETP

Endangered, threatened and protected (ETP) species in WA are protected by various international agreements and national and state legislation. International agreements include:

- Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention).
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- The Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment 1974 (JAMBA)
- The Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986 (CAMBA).
- The Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds 2007 (ROKAMBA).
- Any other international agreement, or instrument made under other international agreements approved by the Minister for Environment.

A comprehensive legal framework is in place to manage ETP interactions with Australian fisheries. The Environment Protection and Biodiversity Conservation (EPBC) Act 1999 is central to this framework at the federal level. The EPBC Act lists southern right whale (*Eubalaena australis*), humpback whale (*Megaptera novaeangliae*), Australian sea lion (*Neophoca cinerea*), marine turtles, and whale shark (*Rhincodon typus*) as marine species which are threatened. State legislation also applies, including the protections of the Biodiversity Conservation Act 2016.

International agreements relating to ETPs that interact with this fishery include the Conventions on the Conservation of Migratory Species of Wild Animals (CMS) and Conventions on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Appendix 1 of both agreements lists humpback and southern right whales).

Humpback whales are often seen with calves, especially in Geographe Bay and Flinders Bay, suggesting that these areas are being used as nursery grounds. The southern right whale utilises Flinders Bay as a calving and nursing ground (DEC 2013). An estimated 10 per cent of the Australian southern right whale population is present in Flinders Bay annually (Burton, *pers. comm.*). The New Zealand fur seal (*Arctocephalus forsteri*) western most breeding colony of this species is found in Flinders Bay. Loggerhead turtles (*Caretta caretta*) have been observed at the site preying on the abalone and various sharks occur within Flinders Bay. Therefore, potential interaction can occur with humpback and southern right whale as well as fur seals, sharks and turtles.

In 2016, a mako shark became entangled in mooring lines at the WAEGAF grow out site which is the only direct interaction reported by the WAEGAF since the operation began.

The WAEGAF is aware of relevant legislation for the protection endangered, threatened and protected (ETP) and if any entanglement or negative interaction occur, the WAEGAF will immediately notify the local Department of Biodiversity, Conservation and Attractions (DBCA) office (MEMP 2020). Overall, the risk of entanglement in moorings of the lease markers is considered low (MEMP 2020).

Table 8 – Scoring elements			
Component	Scoring elements	Designation	Data-deficient
Target	Greenlip abalone ( <i>Haliotis laevigata</i> )	NA	No
Primary	Western rock octopus ( <i>Octopus djinda</i> sp. nov.)	Minor	No
Primary	Rock lobster ( <i>Panulirus cygnus</i> )	Minor	No
Secondary	Epibionts (sponges and small invertebrates, coralline algae, macroalgal seedlings)	Minor	Yes
ETP	Humpback whale ( <i>Megaptera novaeangliae</i> )	NA	No
ETP	Southern right whale ( <i>Eubalaena australis</i> )	NA	No
ETP	Australian fur seals ( <i>Arctocephalus forsteri</i> )	NA	No
ETP	Loggerhead turtle ( <i>Caretta caretta</i> )	NA	No
ETP	Mako shark ( <i>Isurus</i> sp.)	NA	No
Habitat	Sand	Commonly encountered, Main	No
Habitat	Hard substrate Reef, Boulders with Macroalgae	Commonly encountered, Main	No
Habitat	Seagrass	VME	No
Ecosystem		NA	No

### 7.3.2 Principle 2 Performance Indicator scores and rationales

#### PI 2.1.1 – Primary species outcome

PI 2.1.1 The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI				
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Main primary species stock status			
	Guide post	Main primary species are <b>likely</b> to be above the PRI.  OR  If the species is below the PRI, the UoA has measures in place that are <b>expected</b> to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are <b>highly likely</b> to be above the PRI.  OR  If the species is below the PRI, there is either <b>evidence of recovery</b> or a demonstrably effective strategy in place <b>between all MSC UoAs which categorise this species as main</b> , to ensure that they collectively do not hinder recovery and rebuilding.	There is a <b>high degree of certainty</b> that main primary species are above the PRI <b>and are</b> fluctuating around a level consistent with MSY.
		Met?	<b>NA</b>	<b>NA</b>

Rationale

The only primary species, octopus (*Octopus djinda*) and rock lobster (*Panulirus cygnus*) are minor (<5%, see under b) and therefore the scoring issue is NA.

<b>b</b>	Minor primary species stock status			
	Guide post	Minor primary species are highly likely to be above the PRI.  OR  If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.		
		Met?		

Rationale

Primary species impacted by the UoA are octopus (*Octopus djinda*) and rock lobster (*Panulirus cygnus*). The WAEGAF removes these species from the lease side ad hoc when encountered (DPIRD 2022). Number of individuals removed are low (100-500 per year max) and although it has not been quantified fully, these species would consist of <5% of the UoA catch in weight, following the MSC guidance SA3.4.2. – 3.4.5. Neither octopus nor rock lobster are less resilient species and would not meet the “main species” criteria, there are also likely <2% catch in weight (see SA3.4.2.2). Therefore, both species are

considered minor species for this assessment. There are no other primary species. Both rock lobster and octopus are assessed by the management agency. The 2021 stock assessment indicates that the rock lobster resource is in a healthy condition and is being sustainably fished at current harvest rates. Future projections suggest that lobster biomass and levels of egg production will be maintained well above threshold levels (de Lestang et al. 2021). Octopus have been well above the target reference point and fluctuating around a level consistent with MSY (Hart et al. 2018, DPIRD 2020). Both rock lobster and octopus fisheries are MSC certified and they are highly likely above PRI. The updated ERA considered predator removal, such as the removal of octopus, and ranked the risk as negligible (DPIRD 2022). There are no other primary minor species. The SG100 is met.

References

de Lestang, S., How, J., Caputi, N. (2021). Audit reporting for Western Rock Lobster Resource. Pp15.

DPIRD (2020). Octopus Interim Managed Fishery. Science Update 2020. Presentation by A. Hart and D. Murphy to Western Australian Octopus Fishery Annual Management Meeting in September 2020.

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Hart, A.M., Murphy, D.M., Harry, A.V., Fisher, E.A. (2018). Resource Assessment Report Western Australian Octopus Resource. Western Australian Marine Stewardship Council Report Series No. 12. Department of Primary Industries and Regional Development, Western Australia.

DPIRD (2020b). Status Reports of the Fisheries and Aquatic Resources of Western Australia 2019/20: The State of the Fisheries. Government of WA [http://www.fish.wa.gov.au/Documents/sofar/status\\_reports\\_of\\_the\\_fisheries\\_and\\_aquatic\\_resources\\_2019-20.pdf](http://www.fish.wa.gov.au/Documents/sofar/status_reports_of_the_fisheries_and_aquatic_resources_2019-20.pdf)

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

PI 2.1.2 – Primary species management strategy

<b>PI 2.1.2</b>	<b>There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch</b>		
Scoring Issue	SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place		
	Guide post	There are <b>measures</b> in place for the UoA, if necessary, that are	There is a <b>partial strategy</b> in place for the UoA, if necessary, that is

		expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	managing main and minor primary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

A small number of individuals of octopus and rock lobster are taken (100- 500 individual per year of each species- B. Adams, pers.com. February 2022, DPIRD 2022). The take is under a recreational fishing license with bag limits for both species (DPIRD 2020). The updated ERA ranked the risk of the activity as negligible (DPIRD 2022). As the primary species are minor species and a negligible risk was assigned, a strategy is not necessary for the two primary species and the SG 60 and SG80 is met. The SG 100 is not met as the minor primary species do not have a sufficient strategy to manage the UoA impact.

<b>b</b> Management strategy evaluation				
	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Small numbers of individuals are taken, and rock lobster are only removed during their 2-week migration in summer. As the recreational take estimates are considered in stock assessments of these species these measures are likely to work. In addition, periodical risk assessments are undertaken with the most recent one conducted in October 2021 (DPIRD 2022) and SG 60 and SG80 is met. There has been no testing to support this with high confidence as there is no reporting required and the SG 100 is not met.

<b>c</b> Management strategy implementation				
	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its overall objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The use of recreational bag limits have been in place since 2018 for octopus and rock lobster and has been fully implemented for this UoA. The SG 80 is met but not SG 100 as its simply a measure and not a strategy.

<b>d</b> Shark finning				
	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

Scoring issue is not scored as sharks are not caught.

<b>e</b> Review of alternative measures				
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

There is no unwanted catch of primary species and hence the issue has not been scored.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 2.1.3 – Primary species information

<b>PI 2.1.3</b>	<b>Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species</b>		
Scoring Issue	SG 60	SG 80	SG 100

Information adequacy for assessment of impact on main primary species				
<b>a</b>	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b> <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is <b>adequate to assess</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b> <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main primary species with respect to status.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The only primary species are rock lobster and octopus and they are minor species. Therefore, the SG 100 is met by default.

Information adequacy for assessment of impact on minor primary species				
<b>b</b>	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			<b>No</b>
Rationale				

The only primary species are rock lobster and octopus. Recreational bag limits are observed and estimates of removals are provided by the WAEGAF (B. Adams, pers. com. February 2022, DPIRD 2022). Records on octopus removal for 2016 were also provided for that year only. Therefore, some quantitative information available. The number is very low but there is no recording or reporting on the actual take in recent year and therefore SG 100 is not met.

Information adequacy for management strategy				
<b>c</b>	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> primary species and evaluate with a <b>high degree of certainty</b> whether the strategy is achieving its objective.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

Rationale

There are only minor primary species and the SG 60 and 80 is met. Daily bag limits for octopus and rock lobster give some quantitative information of the maximum amount of the primary species taken and estimates have been provided by the WAEGAF. This information however is not considered adequate to support a strategy to manage the minor species with high degree of certainty. The SG100 is not met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

**Draft scoring range**

**≥80**

Information gap indicator

**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score

**85**

Condition number (if relevant)

**NA**

PI 2.2.1 – Secondary species outcome

**PI 2.2.1**

**The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit**

Scoring Issue

SG 60

SG 80

SG 100

Main secondary species stock status

**a**

Guide post

Main secondary species are **likely** to be above biologically based limits.

OR

If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding.

Main secondary species are **highly likely** to be above biologically based limits.

OR

If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding.

AND

Where catches of a main secondary species outside of biological limits are **considerable**, there is either **evidence of recovery** or a, **demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species**, to ensure that they

There is a **high degree of certainty** that main secondary species are above biologically based limits.

		collectively do not hinder recovery and rebuilding.	
Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

Rationale

There are no main secondary species, as no species comprises 5% or more by weight of the total catch or the 2% or more by weight of the total catch for less resilient species, therefore this scoring issue is not applicable.

Minor secondary species stock status

<b>B</b>	Guide post	Minor secondary species are highly likely to be above biologically based limits.  OR  If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species	
	Met?		<b>No</b>

Rationale

Abalone shells are overgrown with coralline algae, sponges and small invertebrates. Although it has not been quantified, these species would consist of <5% of the UoA catch, following the MSC guidance SA3.4.4 – 3.4.5 are therefore considered minor. The updated ERA for Western Australian Abalone conducted in October 2021 considered commensal species and ranked the risk to the species as negligible (DPIRD 2022). There are no biologically based limits for the minor secondary species in this assessment the RBF would be needed to assess the status of minor secondary species (in accordance with Table 3 of the FCP). Following the MSC interpretation (<https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233>) the team decided not to use the RBF (as supported by clause PF4.1.4) and the PI score is capped at SG 80 following PF5.3.2.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 2.2.2 – Secondary species management strategy

<b>PI 2.2.2</b>		<b>There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>partial strategy</b> in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>strategy</b> in place for the UoA for managing main and minor secondary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The “gear” hand collection is very selective and no other than the minor commensal species growing on the shell of abalone are caught. Therefore, the measures are not deemed necessary, and the SG 60 and SG 80 is met.

The Harvest Strategy for the wider abalone fishery has reference levels and control rules for bycatch (non-ETP) species (DPIRD 2021). The management objective for this strategy is to ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations. This covers all bycatch species (non-ETP) with specific reference to commensal species. The performance indicators for this strategy are periodic risk assessments incorporating current management arrangements, catch levels, species information and available research. The SG 100 is met.

Management strategy evaluation				
<b>B</b>	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

A risk assessment conducted on the whole commercial abalone fishery considered the removal of commensal species a negligible risk rating, (Webster et al. 2017). This risk assessment provides an objective basis for confidence. The ERA was updated in October 2021 and confirmed the negligible risk rating (DPIRD 2022); the SG 60 and SG80 are met. However, testing has not been undertaken and the SG 100 is not met.

Management strategy implementation				
<b>C</b>	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

A negligible risk rating in 2016 as well as the updated version in 2021 (Webster et al. 2017; DPIRD 2022) indicates that the strategy of only using hand collection as the gear type is being implemented successfully and the SG80 is met. With no testing and clear evidence that populations of commensal species are not being adversely affected the SG 100 is not met.

Shark finning				
<b>D</b>	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

This scoring issue is not scored as no secondary species are sharks.

Review of alternative measures to minimise mortality of unwanted catch				
<b>E</b>	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of all secondary species, and they are implemented, as appropriate.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

There are no main secondary species and no unwanted catch. Therefore, this scoring issue is not scored.

### References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>85</b>
Condition number (if relevant)	<b>NA</b>

### PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status.  OR <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status.  OR <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main secondary species with respect to status.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

There are no main secondary species in the fishery as no species comprises 5% or more by weight of the total catch or the 2% or more by weight of the total catch for less resilient species (MSC 2018) and therefore this scoring issue is NA.

Information adequacy for assessment of impacts on minor secondary species	
<b>b</b>	Guide post  Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.

Met?			<b>No</b>
Rationale			

There is no quantitative information available to estimate the impact of UoA on minor secondary species. The SG 100 is not met.

Information adequacy for management strategy				
<b>C</b>	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> secondary species and <b>evaluate</b> with a <b>high degree of certainty</b> whether the strategy is <b>achieving its objective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

There are no main secondary species. Therefore, the SG 60 and SG 80 is met by default. There is however, no quantitative information on the minor species and the SG 100 is not met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022

MSC (2018). MSC Fisheries Standard v. 2.01. pp. 289.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 2.3.1 – ETP species outcome

PI 2.3.1 The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species				
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the <b>effects of the UoA</b> on the population/ stock are known and <b>likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, the <b>combined effects of the MSC UoAs</b> on the population /stock are known and <b>highly likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a <b>high degree of certainty</b> that the <b>combined effects of the MSC UoAs</b> are within these limits.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

This scoring issue has not been scored as there are no national or international requirements that set limits for ETP species following SA3.10.1.1 (MSC 2018).

Direct effects				
B	Guide post	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Direct effects of the UoA are <b>highly likely</b> to not <b>hinder recovery</b> of ETP species.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental direct effects</b> of the UoA on ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Potential interaction can occur with humpback and southern right whales as well as fur seals, sharks and turtles. A formal risk assessment conducted for the wider commercial abalone fishery indicated that any potential impacts of the fishery on ETP species (e.g., whales, sharks) are highly unlikely and primarily centre around interactions such as vessels strikes and entanglements with hookah air-hoses. The ERA was updated in October 2021 and specifically assigns a negligible risk rating to ETP species coming from this fishery (DPIRD 2022). In addition, the risk of entanglement in moorings of the lease markers of the WAEGAF is considered low (MEMP 2020). The SG 60 and SG 80 are met.

There is a high degree of certainty that the risk of the WAEGAF vessels striking ETP species is no greater than any other water users and the risk of hookah air-hose entanglements would be negligible. The risk of entanglements with moorings is also considered low (MEMP 2020). One mako shark interaction was reported by the WAEGAF in 2016 and no interactions have been reported since. This meets the requirements for the SG100 level.

Indirect effects				
C	Guide post	Indirect effects have been considered for the UoA and are thought to be		There is a <b>high degree of confidence</b> that there are no <b>significant</b>

		<b>highly likely</b> to not create unacceptable impacts.	<b>detrimental indirect effects</b> of the UoA on ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>
Rationale			

Loggerhead turtles are known to prey on abalone particularly at the lease site (B. Adams pers comm). However, given that there are no known ETP or any other species, reliant on abalone as their main food source. that the fishery would create unacceptable impacts.

This meets the requirements for the SG80 and SG 100 level as there is a high degree of confidence that there are no significant detrimental indirect effects of the UoA catch on ETP species like turtles.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

MSC 2018. MSC Fisheries Standard v. 2.01. pp. 289.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

PI 2.3.2 – ETP species management strategy

<b>PI 2.3.2</b>	<p><b>The UoA has in place precautionary management strategies designed to:</b></p> <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the UoA does not hinder recovery of ETP species.</li> </ul> <p><b>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species</b></p>		
Scoring Issue	SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place (national and international requirements)		
	<p>Guide post</p> <p>There are <b>measures</b> in place that minimise the UoA-related mortality of ETP species, and are expected to be <b>highly likely to achieve</b> national and international</p>	<p>There is a <b>strategy</b> in place for managing the UoA’s impact on ETP species, including measures to minimise mortality, which is designed to be <b>highly likely to achieve</b></p>	<p>There is a <b>comprehensive strategy</b> in place for managing the UoA’s impact on ETP species, including measures to minimise mortality, which is designed to <b>achieve</b></p>

		requirements for the protection of ETP species.	national and international requirements for the protection of ETP species.	<b>above</b> national and international requirements for the protection of ETP species.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

Rationale

This scoring issue has not been scored as there are no national or international requirements for ETP species and no limits have been set for any ETP species following SA3.11.2.1 (MSC 2018).

Management strategy in place (alternative)

<b>b</b>	Guide post	There are <b>measures</b> in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>strategy</b> in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>comprehensive strategy</b> in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

Rationale

The updated Harvest Strategy for the wider commercial abalone fishery (2021-2026) has reference levels and control rules for the management of ETP species. The management objective for this strategy is to ensure fishing impacts do not result in serious harm to ETP species populations. This covers all ETP species. The performance indicator for this strategy is periodic risk assessments incorporating current management arrangements, number of reported interactions, species information and available research. The ERA was updated in October 2021 and a draft report provided to the team confirming negligible risk to all ETP species (DPIRD 2022). The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e., high) to any bycatch species' population. The control rule response to any breach of the threshold is an investigation into variation and appropriate management actions implemented to reduce risk to an acceptable level (Department of Fisheries 2016). This meets the requirements for the SG 60 and SG 80 level. The SG 100 is not met as the specific details of the WAEGAF operation, including lease markers and moorings for example, has not been considered.

Management strategy evaluation

<b>c</b>	Guide post	The measures are <b>considered likely</b> to work, based on <b>plausible argument</b> (e.g., general experience, theory or comparison with similar fisheries/species).	There is an <b>objective basis for confidence</b> that the measures/strategy will work, based on <b>information</b> directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a <b>quantitative analysis</b> supports <b>high confidence</b> that the strategy will work.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

Rationale

The operational measure of the fishing gear is considered likely to work for managing direct UoA impacts on ETP. This is based on confidence of the fishing method’s selectivity and the low risk of entanglement with moorings as well as only one ETP interaction reported by the WAEGAF in 2016. The SG 60 and SG 80 are met.

A quantitative analysis is not available to support high confidence that the strategy will work, and SG100 is not met.

Management strategy implementation				
<b>d</b>	Guide post		There is some <b>evidence</b> that the measures/strategy is being implemented successfully.	There is <b>clear evidence</b> that the strategy/comprehensive strategy is being implemented successfully and <b>is achieving its objective as set out in scoring issue (a) or (b)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

There is evidence that the selective fishing method as the only method to harvest abalone has been implemented successfully. Moorings are maintained by the WAEGAF and provide a low risk for entanglements meeting the SG 80. However, there is no clear, documented evidence and the SG 100 is not met.

Review of alternative measures to minimise mortality of ETP species				
<b>e</b>	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>
Rationale				

Direct UoA-related mortality of ETP has been reported only once (interaction with a mako shark in 2016) and are a negligible risk has been assigned according to the updated ERA (DPIRD 2022). Therefore, this scoring issue is not scored.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

MSC 2018. MSC Fisheries Standard v. 2.01. pp. 289.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

### PI 2.3.3 – ETP species information

PI 2.3.3	<b>Relevant information is collected to support the management of UoA impacts on ETP species, including:</b> <ul style="list-style-type: none"> <li>- Information for the development of the management strategy;</li> <li>- Information to assess the effectiveness of the management strategy; and</li> <li>- Information to determine the outcome status of ETP species</li> </ul>			
	Scoring Issue	SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.	Some quantitative information is <b>adequate to assess</b> the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Some quantitative information is <b>adequate to assess productivity and susceptibility attributes</b> for ETP species.	Quantitative information is available to assess with a high degree of certainty the <b>magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status</b> of ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Some quantitative information is available through the statutory reporting of ETP species interactions. According to the MEMP (2020) the WAEGAF is aware of the legislation and staff would report any entanglement or negative interaction with ETP immediately to the local Fisheries (DPIRD) or DBCA office. There has been only one interaction reported to date.

Any risk of the wider abalone fishery including this operation is assessed during periodic risk assessments (Webster 2017). The ERA was updated in October 2021 confirming negligible risk rating to all ETP species. This meets the requirements for the SG 60 and SG 80 level assessing the level of quantitative

information as adequate. The quantitative information available for the updated ERA was not sufficient to assess the magnitude of fishery related impacts on ETP with high degree of certainty and the SG 100 is not met.

Information adequacy for management strategy				
<b>b</b>	Guide post	Information is adequate to support <b>measures</b> to manage the impacts on ETP species.	Information is adequate to measure trends and support a <b>strategy</b> to manage impacts on ETP species.	Information is adequate to support a <b>comprehensive strategy</b> to manage impacts, minimise mortality and injury of ETP species, and evaluate with a <b>high degree of certainty</b> whether a strategy is achieving its objectives.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The information pertaining to the management of ETP species is appropriate to the associated risk of the wider commercial abalone fishery to ETP species. The updated ERA considers this fishery (i.e., WAEGAF) specifically with negligible risk (DPIRD 2022). Given the very selective gear, hand collection the information seems adequate to support a strategy. The SG 60 and SG 80 are met. It is however not a comprehensive strategy, and the SG 100 is not met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 2.4.1 – Habitats outcome

<b>PI 2.4.1</b>	<b>The UoA and its associated enhancement activities do not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates</b>		
Scoring Issue	SG 60	SG 80	SG 100

Commonly encountered habitat status				
<b>a</b>	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

Commonly encountered habitats within Flinders Bay are sand, boulders or reef with macroalgae and sparse seagrass (DEC, 2013). The lease area predominantly has sand and sparse seagrass patches (assessed under VMEs (B. Adams, pers com. February 2022)). The structures used for the enhancement activity in Flinders Bay (“ABITATS” concrete structures see Figure 1) are primarily set on sandy areas which is the only commonly encountered habitat in the lease area. The only hard substrate are the “ABITATS” (DPIRD 2022). As these are very common in and around Flinders Bay it is highly unlikely that the UoA and the enhancement activities would reduce structure and function of these habitats and the SG 60 and 80 is met. This was further explained during the onsite meeting as dark areas on aerial photographs indicate seagrass and lighter areas sand. In addition, the ERA conducted for the wild fishery on a variety of habitats rated the risk as negligible for the harvest activity which would also apply here (Webster 2017). The updated ERA (2021) ranked habitat impacts from this fishery as negligible (DPIRD 2022). Interviews with the client at the site visit confirmed that during the time of operation in Flinders Bay there has been no major change in main habitat distribution. The SG 100 is met as there is knowledge that sand is extending beyond the lease area and evidence that the fishery is highly unlikely to reduce structure and function of sand habitat (DPIRD 2022).

VME habitat status				
<b>b</b>	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

There are Vulnerable Marine Ecosystems (VMEs) as defined by the MSC Standard V2.01 (GSA3.13.3.2) that may be impacted upon by the UoA. Seagrass has been identified within Flinders Bay, it is sparse within the lease but can be considered a VME which could be impacted by the enhancement activity. The lease area for the enhancement activity is inside the Ngari Capes Marine Park within the “General Use Zone”.

The structures (“ABITATS”) for the enhancement activity are placed on sandy bottom away from seagrass and reef (MEMP 2020) and therefore are unlikely to reduce structure and function and the SG 60 is met.

The highly selective harvest method of hand collection is highly unlikely to reduce structure and function and the SG 80 is met for that component of the operation. The small footprint of the enhancement activity further supports the conclusion that impacts on seagrass do not include serious or irreversible harm overall and the SG 80 is met.

Sediment sampling and analyses has been conducted to investigate nutrient enrichment as an impact of the UoA on habitat and possibly seagrass. The frequency of sampling has now been reduced to every 5 years as no changes inside the lease area has been observed (MEMP 2020). The updated ERA ranked the risk of this fishery on seagrass as negligible as there is no direct interaction with seagrass and no anchoring is done (only permanent moorings are used) (DPIRD 2022).

However, there is no direct evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats (seagrass) to a point where there would be serious or irreversible harm and the SG 100 is not met.

Minor habitat status		
<b>C</b>	Guide post	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?	<b>No</b>
Rationale		

Minor habitats in Flinders Bay are occasional boulders with macroalgae and invertebrates (DEC 2013; B. Adams pers com. February 2022). Independent surveys of 28 sites were conducted by DPIRD research staff within Flinders Bay (Hart et al. 2013 and 2017). These surveys were conducted to estimate growth, survival of released juvenile greenlip abalone into natural habitat. They also provided some information on existing commonly encountered and minor habitats as they included information of habitat, seaweed and other invertebrates at these sites (Hart et al. 2013). Artificial structures are set up on sandy bottom next to but not on top of boulders with macroalgae or sponges (MEMP 2020).

In addition, limited access, small fleet size (5 vessels as specified on the WAEGAF licence item 14), depth constraints of diving (< 20 m), plus vast remote coastlines, all contribute to considerable expanses of abalone habitat being unavailable to the enhanced fishery. As there is no evidence in form of a study on the impact of the enhancement activity on minor habitats the SG 100 is not met.

References

DEC (2013). Ngari Capes Marine Park management plan 2013-2023. Management plan number 74. Department of Environment and Conservation, Perth.  
<https://www.dpaw.wa.gov.au/images/documents/parks/management-plans/decarchive/20120471-ngari-capes-marine-park-mp-74-2013-2023-v10.pdf>

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

MSC 2018. MSC Fisheries Standard v. 2.01. pp. 289.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au)

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>More information sought</b> WAEGAF to provide evidence of habitat type that may be impacted by "abitats"

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>85</b>
Condition number (if relevant)	<b>NA</b>

### PI 2.4.2 – Habitats management

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA and associated enhancement activities do not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a <b>partial strategy</b> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a <b>strategy</b> in place for managing the impact of all MSC UoAs/non-MSC fisheries UoA <b>and associated enhancement activities</b> on habitats.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Impacts of the UoA on habitats are managed through spatial (lease area) management and reporting of

- the number of grow out structures and movement of the structures
- the number and size of abalone moved onto or from each area of the site
- the number of abalone being kept each month at each area of the site
- the number of abalone harvested and removed from each area of the site
- the time, date and details of any inspections of abalone on the grow out structures
- all mortalities and all health certificates.

The WAEGAF developed an Aquaculture Management and Environmental Monitoring Plan (MEMP) in 2016 and revised version in 2020.

While seagrass communities were identified as VMEs, move-on rules were not considered applicable for this fishery as there is no interaction of the UoA with the VME (s) or potential VME (s). The WAEGAF MEMP stipulates that the grow-out structures ("ABITATS") will not be placed directly on seagrass but will

be deployed on clear sand patches (MEMP, 2020). This was clarified by the WAEGAF at the site visit. Following the MSC interpretation and guidance the team does not need to specify a management response for SG60 or SG80 in those cases as it is not deemed necessary clause (see MSC Fishery Standard Guidance Table GSA 3 and Table SA8).

The management objective for the wider commercial fishery is to ensure the effects of fishing, which would include the harvest of enhanced stock as well as broodstock collection, do not result in serious or irreversible harm to habitat structure and function. This covers rocky reefs, macroalgae, seagrass beds, sponges and corals. For the wider fishery periodic ecological risk assessments are undertaken including the enhancement activities. The updated ERA assess impact of the UoA on all habitat types as negligible (DPIRD 2022). The reference level threshold is defined as when fishing impacts are considered to generate an undesirable level of risk (i.e., high) to any benthic habitat.

These together are considered a partial strategy but not a full strategy and the SG80 is met but not the SG 100.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are <b>considered likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/ enhancement activities/habitats).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on <b>information directly about the UoA, enhancement activities and/or habitats</b> involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on <b>information directly about the UoA, enhancement activities and/or habitats</b> involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The development and implementation of a MEMP and testing and reporting requirements within this provides some objective confidence that that the partial strategy will work. This position is strengthened by the conditions in which the fishery operates both physically (i.e., highly resilient habitats) and commercially (small fleet, limited fishing effort and footprint as well as placement of "ABITAT" on sand following the MEMP and harvest method that limit habitat contact). This meets the requirement for the SG 60 and SG 80 level. Testing of sediment over several year indicated no impact for the enhancement activity on the sediment and resulted in an amendment to the MEMP which now requires the client to conduct testing every 5 years. These tests were directly based on the UoA enhancement activity and habitats involved and the SG 100 is met.

Management strategy implementation				
<b>c</b>	Guide post		There is <b>some quantitative evidence</b> that the measures/partial strategy is being implemented successfully.	There is <b>clear quantitative evidence</b> that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The WAEGAF MEMP stipulates that the grow-out structures (“ABITATS”) will not be placed directly on seagrass but will be deployed on clear sand patches (MEMP, 2020). This has been verified with the WAEGAF through photographic evidence (see Figure 9) and video clips as well as with DPIRD staff. Staff of the management agency DPIRD conduct annual abalone biomass surveys but also observe the placement of the “ABITATS”. During the site visit staff were interviewed and confirmed placement on sand only. This is evidence that the strategy has been implemented successfully. Testing of sediment provides some additional quantitative evidence.

The ERA rated the potential impacts of wider fishery activities on all relevant habitats as negligible and the enhancement activity on the wider ecosystem as medium (Webster 2017). The updated ERA conducted in 2021, confirmed a risk rating for this fishery on all habitat types as negligible (DPIRD 2022).

Together these meet the requirement for the SG80 level. However, it is not clear if all aspects of the MEMP are implemented as reporting on lease conditions has also been limited and the SG 100 is not met.

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
d	Guide post	There is <b>qualitative evidence</b> that the UoA complies with its management requirements to protect VMEs.	There is some <b>quantitative evidence</b> that the UoA and associated enhancement activities comply with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is <b>clear quantitative evidence</b> that the UoA and <b>associated enhancement activities</b> comply with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
		Met?	Yes	No

Rationale

Compliance with relevant management requirements to protect VMEs include photographs supplied by the WAEGAF showing light sandy patches throughout the lease area, some darker ones are sand with dense drift macroalgae and some darker ones are reefs. As explained above further photographs were provided by WAEGF to confirm placement of “ABITATS” on sand. Interviews with DPIRD staff conducting annual abalone biomass surveys also confirmed placement on sand. The SG 60 is met. Therefore, there is only qualitative evidence but no quantitative evidence that this part of the measures/partial strategy relevant for VMEs (seagrass beds) is being implemented successfully. The SG80 is not met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au)

<b>Draft scoring range</b>	<b>60-80</b>
Information gap indicator	<b>More information sought</b> Evidence of habitat type that may be impacted by the enhancement activity and evidence of implementation of the measures/ partial strategy.

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>3</b>

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and associated enhancement activities and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	The types and distribution of the main habitats are <b>broadly understood</b> .  <b>OR</b> <b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and <b>vulnerability</b> of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.  <b>OR</b> <b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Commonly encountered habitats within Flinders Bay are sand, rocky reef (granite or limestone) with macroalgae and sparse seagrass (DEC 2013). For several years sites in Flinders Bay were surveyed by DPIRD research staff where juvenile greenlip abalone were released into natural habitats leading up to the establishment of the WAEGAF (2013-2016) (Hart et al. 2013 a, b). These surveys also including information of habitat, seaweed and other invertebrates at these sites and provided some information on commonly encountered and minor habitats within the bay. This meets the SG 60 and 80. Seagrass has not received particular attention in these surveys or by monitoring efforts of the WAEGAF within or outside the lease area and the SG100 is not met.

<b>b</b>	Information adequacy for assessment of impacts			
	Guide post	Information is adequate to broadly understand the	Information is adequate to allow for identification of the	The physical impacts of the gear and

	<p>nature of the main impacts of gear use and enhancement activities on the main habitats, including spatial overlap of habitat with fishing gear.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	<p>main impacts of the UoA and enhancement activities on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	<p>enhancement activities on all habitats have been quantified fully.</p>
Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

Rationale

The provided habitat information is adequate to determine the risk posed by the UoA (Hart et al. 2017). The gear used in the fishery does not generally interact with the habitat for the enhanced fishery. The number and placements of "ABITATS" within the lease area is well known. There are also a known number of moorings at each end of a group of "ABITATS". Vessels are tight up to moorings and do not anchor and the divers remain above the seafloor whilst releasing juveniles and harvesting abalone. That meets the SG 60 and 80. However the impact from the "ABITATS" on all habitats has not been quantified and the SG 100 is not met.

<b>Monitoring</b>			
<b>C</b>	Guide post	Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?	<b>No</b>	<b>No</b>

Rationale

Fishery independent surveys (FIS) for the wider fishery, covering a total of 217 survey sites that were selected on the basis of known stock distribution and different levels of productivity. These FIS are ongoing. A further 150 sites were established as baselines for proposed marine parks and surveyed in 2007 only, and an additional 28 sites were also surveyed over several years including information of habitat, seaweed and other invertebrates at these sites (Hart et al. 2013c). Adequate information has not been collected to detect any increase in risk to the main habitats as changes to habitat distributions are not measured. The SG 80 is not met.

References

DEC (2013). Ngari Capes Marine Park management plan 2013-2023. Management plan number 74. Department of Environment and Conservation, Perth.  
<https://www.dpaw.wa.gov.au/images/documents/parks/management-plans/decarchive/20120471-ngari-capes-marine-park-mp-74-2013-2023-v10.pdf>

Hart, A.M., Strain, L., Fabris, F., Brown, J., and Davidson, M. (2013b). Stock enhancement of Greenlip abalone Part I: Long-term growth and mortality. *Reviews in Fisheries Science* 21(3-4): 299-309.

Hart A.M., Fabris F., Murphy D., Brown J., Strain M. and Davidson M. (2013c). Stock enhancement of Greenlip abalone Part II: Population and ecological effects. *Reviews in Fisheries Science* 21(3-4): 310-320.

Hart, A.M., Strain, L., Hesp, A., Fisher, E., Webster, F., Brand-Gardner, S., Walters, S. (2017). Marine Stewardship Council Full Assessment Report Western Australian Abalone Managed Fishery.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>More information sought</b> Information on abalone survey sites within Flinders Bay. Are site selection of the enhanced fishery still monitored and are results analysed?

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>4</b>

### PI 2.5.1 – Ecosystem outcome

PI 2.5.1 The UoA and associated enhancement activities do not cause serious or irreversible harm to the key elements of ecosystem structure and function				
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Ecosystem status</b>			
	<b>Guide post</b>	The UoA is <b>unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	<b>Met?</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Rationale</b>				

The fishery independent stock surveys of 217 sites across the south coast for greenlip abalone (*H. laevigata*) since 2005 including sites in Flinders Bay. Seventy-one sites in representative sub-areas are surveyed annually, with the others surveyed every 2-3 years.

Visual impact assessments at discrete sites, coupled with spatial management, catch and effort monitoring which includes broodstock and a highly selective fishing method, indicates that the UoA is highly unlikely to disrupt the ecosystem. This meets requirements for the SG 60 and SG 80 level.

The updated ERA considered impacts on trophic interactions, community structure, ghost fishing, genetic diversity and pest and diseases (DPIRD 2022). All impacts were rated as negligible from all sectors

(including this fishery) with ghost fishing considered not applicable because either no gear is lost or considered to not be fishing abalone or any other marine species. The last two impacts are considered under 2.6.1-2.6.3 below.

However, it does not provide explicit evidence that the UoA does not induce serious or irreversible harm to ecosystem structure or function and the SG 100 is not met.

Impacts due to enhancement				
<b>b</b>	Guide post	Enhancement activities are <b>unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	Enhancement activities are <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> that the enhancement activities are <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The WAEGAF developed a MEMP (2016 updated in 2020) for the enhancement activities, which also include a Biosecurity Management Plan, which have details on reporting and monitoring requirements. In terms of risk of introducing or spreading of disease and pests, an Aquavetplan manuals provide agreed management plans and sets of operational procedures that would be adopted in the event of an aquatic animal disease emergency. The ERA conducted in 2016 ranked the risk of the enhancement activity on the ecosystem through disease or pest as medium. The updated ERA reduced the risk score of that impact to negligible, as there has been no AVG detected in WA. There is also long history of prevention and quarantine measures for this disease (DPIRD 2022).

Grow-out structures (“ABITATS”) used for the enhancement activity, are placed on sand and away from seagrass beds. Stocking density is monitored and according to the licence condition for the WAEGAF cannot exceed three kilogram per square meter. According to the annual surveys conducted by DPIRD, the biomass density has not been exceeded (DPIRD Abalone Biomass Survey DPIRD 2016-2020). All this indicates that the UoA is highly unlikely to disrupt the ecosystem.

Hart et al. (2013a, b) conducted a study in Flinders Bay, releasing juvenile greenlip abalone into natural habitat. The abalone growth and survival were monitored over several years and information on habitat, seaweed and other invertebrates was collected. However, the direct impact of the UoA on the ecosystem, like changes in algal biomass, reduction in certain predators (rock lobster, octopus) and impacts on the diets of competitors are not fully understood.

Some aspects, for example the predatory role of octopus on greenlip abalone at the lease in Flinders Bay has been investigated as part of an honours thesis by Greenwell (2017; <https://onlinelibrary.wiley.com/doi/abs/10.1111/fme.12328>). Considering the scale and type of the operation it is highly unlikely to result in serious or irreversible harm and the SG 60 and 80 is met. The impact is however dependent on the biomass of the wild stock in Flinders Bay. In addition, the updated ERA ranked the impact of the enhanced fishery and the wider commercial fishery on trophic structure as negligible. The impact on the wider abalone fishery and greenlip stock has been considered under PI 1.3.1.

References

DPIRD Abalone Biomass surveys 2016-2020.

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Greenwell, C. (2017). Octopus as predators of *Haliotis laevis* on an abalone sea ranch of south-western Australia. Honours thesis, Murdoch University. pp.130.

C.N. Greenwell, C.N, N.R. Loneragan, R. Admiraal, J.R. Tweedley, M. Wall (2019). Octopus as predators of abalone on a sea ranch. *Fisheries management and ecology*, 26 (2019), pp. 108-118 <https://onlinelibrary.wiley.com/doi/abs/10.1111/fme.12328>

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>More information sought</b> <ul style="list-style-type: none"> <li>• Outcome of the updated ERA</li> <li>• Any information or analysis of impact of algal biomass, reduction in certain predators (rock lobster, octopus) and the UOA on competition for food.</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	<b>NA</b>

PI 2.5.2 – Ecosystem management

PI 2.5.2		There are measures in place to ensure the UoA and enhancement activities do not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the UoA on key elements of the ecosystem.	There is a <b>partial strategy</b> in place, if necessary, which takes into account <b>available information and is expected to restrain impacts</b> of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <b>strategy</b> that consists of a <b>plan</b> , in place which contains measures to <b>address all main impacts of the UoA</b> on the ecosystem, and at least some of these measures are in place.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

Impacts of the UoA on ecosystem structure and function are managed through limitation to the one operator (RFA), gear restrictions, spatial (lease area) management, including 2km away from existing abalone populations, wild greenlip abalone broodstock collection limit (300 per year) which is regulated through an exemption for the hatchery (Exemption No. 3183) as well as reporting requirements of

- the number of grow out structures and movement of the structures
- the number and size of abalone moved onto or from each area of the site
- the number of abalone being kept each month at each area of the site
- the number of abalone harvested and removed from each area of the site
- the time, date and details of any inspections of abalone on the grow out structures
- all mortalities and all health certificates.

The WAEGAF developed an Aquaculture Management and Environmental Monitoring Plan (MEMP) in 2016 and revised version in 2020 to deal with the changes to the frequency of sediment monitoring.

The WAEGAF lease is located within the Ngari Capes Marine Park. The Ngari Capes Marine Park management plan 2013-2023 was developed to ensure that commercial fishing activities and aquaculture in the marine park are managed in a manner consistent with maintaining the marine park ecological values while providing opportunities for social and economic benefits; and to maintain ecological values of the marine park important to commercial fisheries and aquaculture.

The management objective for the wider commercial fishery is to ensure the effects of fishing, which would include the harvest of enhanced stock as well as broodstock collection, do not result in serious or irreversible harm to ecosystem structure and function. For the wider fishery periodic ecological risk assessments are undertaken including the enhancement activities. The last ERA was conducted in 2016 and an updated ERA planned for 2021.

Overall, this meets the SG 60 and 80. The SG 100 is not met as there is no plan, in place which contains measures to address all main impacts of the UoA on the ecosystem.

Management strategy evaluation				
<b>b</b>	Guide post	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoA/ ecosystems).	There is <b>some objective basis for confidence</b> that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The ERA identified 9 associated risks to ecosystem structure and the broader environment from the wild sector fishing activities, which includes i) trophic interactions and ii) change in species composition, all were ranked negligible (Webster 2017). In addition, external factors including broodstock collection, introduction of diseases and pests and habitat modification were also assessed. This provides objective confidence that the key risk factors have been identified and measures put in place that will work and the SG 60 is met. The scale and size of the enhancement activity needs to be considered under this scoring issue. The proportion of enhanced juveniles to wild stock has changed significantly in recent years due to a decline of greenlip stock in Area 3 of the wild fishery and an increase in the enhanced fishery. The ERA was updated in October 2021 and confirmed negligible risk rating for the ecosystem

impacts through trophic interactions (DPIRD 2022) and the SG 80 is met. These measures have not been tested at the ecosystem level and the SG 100 is therefore not met.

Management strategy implementation				
<b>c</b>	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The ERA conducted by government and industry representatives deemed the wider fishery to be at negligible risk to ecosystem structure and function. This was confirmed with an updated ERA in 2021 (DPIRD 2022). The partial strategy with multiple measures for the wider fishery seems to be implemented successfully as compliance appears to be good (see PI 3.2.3). This meets the requirements for the SG80 level. The ongoing wider fishery performance against long-term objectives for ecosystems is monitored annually via the harvest strategy. However, these have not been met in recent years and the SG 100 is not met.

Management of enhancement activities				
<b>d</b>	Guide post	There is an <b>established</b> artificial production strategy in place that is expected to achieve the Ecosystem Outcome 60 level of performance.	There is a <b>tested and evaluated</b> artificial production strategy with sufficient monitoring in place and evidence is available to reasonably ensure with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.	There is a <b>comprehensive and fully evaluated</b> artificial production strategy to verify with certainty that the Ecosystem Outcome 100 level of performance.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

The WAEGAF developed an Aquaculture Management and Environmental Monitoring Plan (MEMP) in 2016 and revised version in 2020. This meets the SG 60. The MEMP does not include the hatchery component or any records of hatchery production or genetic strategy to maintain genetic diversity to demonstrate effective in achieving the Ecosystem Outcome 80 level of performance. The MEMP also has not been tested or evaluated fully. Therefore, the SG 80 is not met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Ocean Grown Abalone Pty. Ltd (2016). Aquaculture management and environmental monitoring plan (MEMP). pp.52.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au)

<b>Draft scoring range</b>	<b>60-79</b>
Information gap indicator	<p><b>More information sought</b></p> <ul style="list-style-type: none"> <li>Estimate of proportion of released stock versus wild stock in Flinders Bay.</li> <li>Outcome of the updated ERA</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>5</b>

### PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA and associated enhancement activities on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	Information is adequate to <b>identify</b> the key elements of the ecosystem.	Information is adequate to <b>broadly understand</b> the key elements of the ecosystem.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				

The fishery independent surveys conducted by DPIRD cover a considerable time series of the ecosystem including the enhanced fishery area (Hart et al. 2013 and 2016). This information coupled with research from the university and private sectors has enabled the acquisition of a broad understanding of key ecosystem elements in the wider ecosystem and including Flinders Bay (e.g., McClatchie et al. 2006). The predatory role of octopus on greenlip abalone in Flinders Bay has been investigated as part of an honours thesis (Greenwell 2017; Greenwell et al. 2019). This provides a solid basis from which to infer and understand the key elements of the ecosystem. This meets the requirements for the SG 60 and SG80 level.

		Investigation of UoA impacts		
<b>b</b>	Guide post	Main impacts of the UoA and associated enhancement activities on these key ecosystem elements can be inferred	Main impacts of the UoA and associated enhancement activities on these key ecosystem elements can be inferred	Main interactions between the UoA and associated enhancement activities and these ecosystem elements can be inferred

		from existing information, and <b>have not been investigated in detail.</b>	from existing information and <b>some have been investigated in detail.</b>	from existing information and <b>have been investigated in detail.</b>
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The ecosystem effects of abalone fishing have been investigated in greater detail in other Australian states (Jenkins 2004; Hamer 2010). In addition, the ERA identified 9 associated risks to ecosystem structure and the broader environment from the wild sector fishing activities, which include i) trophic interactions and ii) change in species composition, all were ranked negligible as well as risk factors associated with the enhancement activities such as broodstock collection, introduction of diseases and pests and habitat modification were also assessed. Therefore, the main impacts of the UoA can still effectively be inferred from existing information and risk assessments. The ERA has been updated in 2021 considering the advanced enhancement fishery with higher stocking biomass (DPIRD 2022). All ecosystem risk factors were ranked negligible, and the SG 60 and SG 80 are met. The SG 100 is not met as not all of them have been investigated in detail.

Understanding of component functions				
<b>C</b>	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are <b>known.</b>	The impacts of the UoA and associated enhancement activities on P1 target, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are <b>understood.</b>
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The function of the target species (greenlip abalone) in the ecosystem is well researched and understood (Mayfield et al. 2012). Due to the highly selective gear type, there are very few primary, secondary and ETP species impacted by the UoA and their function in the ecosystem is also known. There is an overall understanding of the function of main habitats and the subsequent influence on ecosystem function and the SG 80 is met. A knowledge gap concerns effects of the UoA on competition and impacts on the diets of competitors, which is not fully understood, and the SG 100 is not met. The impact on the wider abalone fishery and greenlip stock has been considered under PI 1.3.1.

Information relevance				
<b>d</b>	Guide post		Adequate information is available on the impacts of the UoA and associated enhancement activities on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the fishery and associated enhancement activities on the components <b>and elements</b> to allow the main consequences for the ecosystem to be inferred.
	Met?			

Met?	No	No
Rationale		

There are many case studies from other abalone fisheries in Australia that have been documented, which provides valuable accounts to make relevant inferences for the wider abalone fishery. Regarding the UoA, surveys including habitat information and biota have been conducted by DIPIRD as part of their biomass surveys, including survey sites in Flinders Bay and the wider fishery FIS program is ongoing but focusses on abalone biomass. Information relevant to the ecosystem like algal and seagrass biomass, species composition, competitors and predators have not been analysed. At the site visit, the client of the fishery indicate that there are plans to develop a R&D strategy and a research plan for further research to fill that gap. Therefore, the information currently available on the impact of the UoA and associated enhancement activities specifically is not considered adequate, and the SG 80 not met.

Monitoring			
e	Guide post	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?	No	No
Rationale			

Information on the impacts on abalone removal on benthic community structure, is adequate to support the development of strategies to the manage effects (Hart et al. 2013). Minimal information is available on the trophic effects of abalone fishing, predator removals (WAEGAF data from 2016 and estimates) as well as understanding of key impacts like the potential competition for food from the enhancement activity. The ERA has been updated in 2021 and ranked the risk of this fishery on trophic interactions as negligible (DIPIRD 2022). Monitoring in terms of water temperature and swell at the lease area has been put in place in late 2021 and a larger R&D plan is in development. The SG 80 is currently not met.

References

DIPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Greenwell, Claire (2017) Octopus as predators of *Haliotis laevigata* on an abalone sea ranch of south-western Australia. Honours thesis, Murdoch University. pp.130.

C.N. Greenwell, C.N, N.R. Loneragan, R. Admiraal, J.R. Tweedley, M. Wall (2019). Octopus as predators of abalone on a sea ranch. *Fisheries management and ecology*, 26 (2019), pp. 108-118 <https://onlinelibrary.wiley.com/doi/abs/10.1111/fme.12328>

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Hamer, P.A., Jenkins, G.P., Wormsley, B.A. and Mills, K.A. (2010) Understanding the ecological role of abalone in the reef ecosystem of Victoria. Final report to Fisheries Research and Development Corporation. Project No 2006/004. Department of Primary Industries, Queenscliff. 132 pages.

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Hart, A.M., Strain, L., Fabris, F., Brown, J., and Davidson, M. (2013b). Stock enhancement of Greenlip abalone Part I: Long-term growth and mortality. Reviews in Fisheries Science 21(3-4): 299-309.

Hart A.M., Fabris F., Murphy D., Brown J., Strain M. and Davidson M. (2013c). Stock enhancement of Greenlip abalone Part II: Population and ecological effects. Reviews in Fisheries Science 21(3-4): 310-320.

Jenkins, G.P. (2004) The ecosystem effects of abalone fishing: a review. Marine and Freshwater Research 55, 545-552.

McClatchie, S, Middleton, J, Pattiaratchi, C, Durrie, D & Kendrick, G. (2006), The Southwest Marine Region: ecosystems and key species groups, report for the Department of the Environment and Water Resources.

Webster, F. J., Wise, B.S. and Hart, A. (2017). Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, Western Australia. 116pp. wamsc\_report\_no\_7.pdf (fish.wa.gov.au)

<b>Draft scoring range</b>	<b>60-79</b>
Information gap indicator	<b>More information sought</b> <ul style="list-style-type: none"> <li>• Outcome of the updated ERA,</li> <li>• Impact of competition for food and removal of predators on the ecosystem</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>6</b>

### PI 2.6.1 – Translocation outcome

<b>PI 2.6.1</b>		<b>The translocation activity has negligible discernible impact on the surrounding ecosystem</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Impact of translocation activity</b>			
	Guide post	The translocation activity is <b>unlikely</b> to introduce diseases, pests, pathogens, or non-native species (species not already established in the ecosystem) into the surrounding ecosystem.	The translocation activity is <b>highly unlikely</b> to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	There is <b>evidence</b> that the translocation activity is <b>highly unlikely</b> to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

Rationale

The greatest known risk of translocation is the spread of diseases and pests including the spread of Abalone viral ganglioneuritis (AVG) from the farm to the wild stock. The likelihood of this outcome occurring has been assessed as very low by Jones and Fletcher (2012) if suggested hatchery management measures are adopted. To mitigate the risk, each batch of juvenile abalone destined for translocation, requires a veterinary certificate from the DPIRD Fish Health Unit. In addition, the hatchery operates a sentinel testing program for the stock. Once in the enhancement location in Flinders Bay, the abalone are monitored for any signs of AVG. These measures minimize the risk of AVG and other diseases or pest or any other translocation threat occurring. The ERA has been updated in 2021 considering the advanced enhancement fishery with higher stocking biomass and higher number of translocations. All risk factors including those from pest and disease were ranked as negligible (DPIRD 2022). The SG 60, 80 and SG 100 are met.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Jones, J.B. and W.J. Fletcher (2012). Assessment of the risks associated with the release of abalone sourced from Abalone Hatcheries for enhancement or marine grow-out in the open ocean areas of WA. Fisheries Research Report No. 227. 24p.

Ocean Grown Abalone Pty. Ltd (2016). Aquaculture management and environmental monitoring plan (MEMP). pp.52.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52

DPIRD Fish Health certificates

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

PI 2.6.2 – Translocation management

PI 2.6.2		There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Translocation management strategy in place			
	Guide post	There are <b>measures</b> in place which are <b>expected</b> to protect the surrounding ecosystem from the translocation activity at levels	There is a <b>partial strategy</b> in place, if necessary, that is expected to protect the surrounding ecosystem from the translocation activity at levels compatible the SG80	There is a <b>strategy</b> in place for managing the impacts of translocation on the surrounding ecosystem.

		compatible with the SG80 Translocation outcome level of performance (PI 2.6.1).	Translocation outcome level of performance (PI 2.6.1).	
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

A condition of the Aquaculture Licences for both the abalone farm hatchery and sea-ranching site is the development and implementation of a Management and Environmental Monitoring Plan (MEMP), which includes a Biosecurity Plan. These plans are signed off by DPIRD. Testing and monitoring required are set up to protect the surrounding ecosystem from impacts of the translocation activities. This meets the SG 60 and 80. It does not meet SG 100 as ecosystem-based indicators have not been developed or any changes monitored over time.

Translocation management strategy evaluation				
<b>b</b>	Guide post	The measures are considered <b>likely</b> to work based on plausible argument (e.g. general experience, theory, or comparison with similar fisheries/species).	A valid documented risk assessment or equivalent environmental impact assessment demonstrates that the translocation activity is <b>highly unlikely</b> to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	An independent peer-reviewed scientific assessment confirms with a <b>high degree of certainty</b> that there are no risks to the surrounding ecosystem associated with the translocation activity.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

An ERA was conducted to determine the risk of spreading diseases and pest including AVG via translocation, which deemed the risk to be medium (Webster 2017). This risk rating describes current risk control measures in place as acceptable with no new management required. Given that it has been deemed that no action is required, nor history of AVG has been reported in Western Australia and the importation of abalone outside of Western Australia is illegal, an SG80 is considered. The ERA has been updated in 2021 considering the advanced enhancement fishery with higher stocking biomass and higher number of translocations (DPIRD 2022). All risk factors including those from pest and disease were ranked negligible. The SG 60 and SG80 are met. The SG 100 is met as the risk assessment for abalone enhancement or marine grow-out was independently reviewed (Jones and Fletcher 2012).

Translocation contingency measures				
<b>c</b>	Guide post		Contingency <b>measures</b> have been agreed in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation.	A <b>formalised contingency plan</b> in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation is documented and available.
	Met?		<b>Yes</b>	<b>Yes</b>

Rationale

A formal Australian Aquatic Veterinary Emergency Plan and Disease Strategy has been developed for the potential outbreak of any disease including AVG in Western Australia. This meets the SG80. The WAEGAF actively investigates and reports any abnormal mortalities and submits and tests samples. Example of investigations and pathology reports were provided to the assessment team. Similarly, juveniles are tested before being transferred from the hatchery and copies of health certificates were provided for this assessment. In addition, the hatchery operates a sentinel testing program for the stock. These health and surveillance measures are backed up by emergency response plans for both aquatic pests and diseases. This meets the SG 100.

References

DPIRD (2022). Ecological Risk Assessment for the Western Australian Statewide Abalone Resource. Draft January 2022.

Ocean Grown Abalone Pty. Ltd (2016). Aquaculture management and environmental monitoring plan (MEMP). pp.52.

Ocean Grown Abalone Pty. Ltd (2020). Aquaculture management and environmental monitoring plan (MEMP). pp.52.

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	<b>NA</b>

PI 2.6.3 – Translocation information

<b>PI 2.6.3</b>		<b>Information on the impact of the translocation activity on the environment is adequate to determine the risk posed by the fishery</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Information quality</b>			
	<b>Guide post</b>	Information is available on the presence or absence of diseases, pests, pathogens, and non-native species at the source and destination of the translocated stock to guide the management strategy and reduce the risks associated with the translocation.	Information is <b>sufficient</b> to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2).	Information from frequent and <b>comprehensive monitoring</b> demonstrates no impact from introduced diseases, pests, and non-native species with a <b>high degree of certainty</b> .

Met?	Yes	Yes	Yes
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Rationale

All juvenile abalone that are translocated from the farm into the enhancement area in Flinders Bay are provided with a veterinarian certificate. Prior to translocation the juvenile abalone are quarantined for two weeks in a single direction flow-through system with its own dedicated filtration system. Once at the site the abalone are continually monitored. Records and declarations from the Fish Health Unit of DPIRD demonstrate that there have been no incidences of AVG or any other diseases, pests of non-native species during translocation. This meets the requirements for the SG60, SG80 and SG100 level.

References

DPIRD Fish Health Certificates

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	100
Condition number (if relevant)	NA

## 7.4 Principle 3

### 7.4.1 Principle 3 background

#### Area of operation and jurisdiction

The WA enhanced greenlip abalone fishery (WAEGAF) operates in Flinders Bay off the south-west coast of Western Australia. The fishery is contained within WA State waters (within 3 nautical miles from the coast) and in the West Coast Bioregion management area that is managed by the single jurisdiction of the WA State Government. The Offshore Constitutional Settlement sets out the arrangements for Australian States and the Northern Territory to manage fisheries out to 3 nm from the coast.

#### Management framework and objectives

Western Australian fisheries are managed by Western Australia’s Department of Primary Industries and Regional Development (DPIRD) under the following legislation:

- *Fish Resources Management Act 1994 (FRMA)*; and
- *Fish Resources Management Regulations 1995 (FRMR)*.

The fishery-specific management arrangements for the fishery are applied under powers of the FRMA and the FRMR. However, the Western Australian government is introducing an *Aquatic Resources Management Act 2016 (ARMA)* which will become the primary legislation used to manage fishing, aquaculture, pearling and aquatic resources in Western Australia. The ARMA will replace the FRMA (and the Pearling Act 1990), providing a set of new management methods and a modern, flexible framework designed to deliver more effective, efficient and integrated fisheries and aquatic resource management. It will allow for existing management arrangements to remain in place to enable a smooth transition between legislative frameworks. The ARMA is expected to be implemented on or before 1 January 2023.

### *Fish Resources Management Act 1994*

The FRMA provides the overarching legislative framework to implement the management arrangements for the WAEGAF and contains the head powers to grant an aquaculture licence, aquaculture lease, licence conditions and a management and environmental monitoring plan (MEMP).

The objects of the FRMA are:

1. to develop and manage fisheries and aquaculture in a sustainable way; and
2. to share and conserve the State's fish and other aquatic resources and their habitats for the benefit of present and future generations.

The FRMA sets out that the two primary objects will be achieved, in particular, by the following means:

1. conserving fish and protecting their environment;
2. ensuring that the impact of fishing and aquaculture on aquatic fauna and their habitats is ecologically sustainable and that the use of all aquatic resources is carried out in a sustainable manner;
3. enabling the management of fishing, aquaculture, tourism that is reliant on fishing, aquatic ecotourism and associated non-extractive activities that are reliant on fish and the aquatic environment;
4. fostering the sustainable development of commercial and recreational fishing and aquaculture, including the establishment and management of aquaculture facilities for community or commercial purposes;
5. achieving the optimum economic, social and other benefits from the use of fish resources;
6. enabling the allocation of fish resources between users of those resources, their reallocation between users from time to time and the management of users in relation to their respective allocations;
7. providing for the control of foreign interests in fishing, aquaculture and associated industries; and
8. enabling the management of fish habitat protection areas and the Abrolhos Islands reserve.

### *Fish Resources Management Regulations 1995*

The *Fish Resources Management Regulations 1995* (FRMR) contain a number of requirements pertaining to all fisheries in WA. For example, regulation 64 requires commercial fishers to submit mandatory catch and effort or aquaculture production returns in the form approved for that fishery.

### *Other relevant legislation*

In addition to the FRMA and the FRMR, operators must also comply with these pieces of legislation:

- Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Western Australian Marine Act 1982*; and
- *Biodiversity Conservation Act 2016* (Western Australia)

The WAEGAF is located within the Ngari Capes marine park. The Ngari Capes marine park management plan 2013-2023 contains long term objectives for commercial fishing and aquaculture in the marine park. These are:

- to ensure that, in collaboration with the industry and the Department of Fisheries (DoF), commercial fishing activities and aquaculture in the marine park are managed in a manner consistent with maintaining the marine park ecological values while providing opportunities for social and economic benefits; and,

- to maintain ecological values of the marine park important to commercial fisheries and aquaculture.

## Consultation and interest groups

The recognised interest groups in the WAEGAF are:

- DPIRD;
- The Western Australian Fishing Industry Council (WAFIC), and in particular the sector body Aquaculture Council of WA, representing the interests of aquaculturists;
- Recfishwest, representing the interests of recreational fishers;
- Representatives from the conservation sector, including the Conservation Council of Western Australia and World Wildlife Fund for Nature;
- Other State Government Departments (e.g., the Department of Biodiversity, Conservation and Attractions (DBCA) for marine parks and protected species; Department of Transport (DoT) for marking and lighting of aquaculture leases in coastal waters)
- Organisations/institutions undertaking research relevant to the marine environment off Augusta;
- Shire of Augusta-Margaret River as the local Government area to where the fishery is located;
- Investors, banking representatives, boat brokers;
- Fish processors, retailers and consumers; and
- The wider community.

WAFIC is the peak industry body representing professional fishing, pearling and aquaculture enterprises, as well as processors and exporters in WA. WAFIC (and sector body the Aquaculture Council of Western Australia, ACWA) is funded by the WA Government through a service level agreement to undertake certain functions including consultation with the relevant industries. Specific consultation is undertaken by the Industry Consultation Unit.

The DPIRD's approach to stakeholder engagement follows its Stakeholder Engagement Guideline (DoF 2016) designed to assist with selecting the appropriate level of engagement for different stakeholder groups. The DPIRD seeks public comment on research, management and discussion papers through the website. Draft Fisheries Management Papers are released for public comment and those comments are taken into account before a decision is made on future management. For example, the DPIRD made the draft Abalone Resource Harvest Strategy available for public comment for a four-week period (DPIRD 2022). Another recent example was a final draft of the Aquaculture Development Plan that was released on the DPIRD's website for a consultation period, affording the opportunity for public feedback (DPIRD 2020).

Statutory consultation is required for the implementation of fishery management plans and amendments as well as for the grant of an aquaculture licence. Before granting an aquaculture licence, the CEO must advertise a notice of the proposal to allow affected persons the opportunity to apply to the WA State Administrative Tribunal (SAT) for a review of the decision. Pursuant to s.146(e) of the FRMA, an 'affected person' is any person who holds an aquaculture licence and is likely to be significantly affected by the proposal.

Consultation on some specific matters such as the grant of aquaculture leases in coastal waters follows the requirements outlined in Administrative Guideline number 1 (DPIRD 2017c). This process requires applications to be placed onto the DPIRD website for public consultation in addition to referral to relevant organisations (e.g., Department of Transport, Native Title Parties, Department of Biodiversity, Conservation and Attractions etc.). Applications for aquaculture projects that may be considered to have a significant environmental impact will be referred to, and may be formally assessed by, the Environmental Protection Authority (EPA). Stakeholders are also invited to specific workshops including environmental risk assessments or to participate on working groups as required.

## Fisheries Specific Management

The WAEGAF is managed through an array of legislation, measures, rules and policies contained in the:

- FRMA and FRMR
- Management and Environmental Monitoring Plan (including a biosecurity plan)
- Aquaculture lease conditions
- Aquaculture Licence conditions
- ACWA Code of Practice for the Abalone Aquaculture Industry
- WA's Abalone Aquaculture Policy (DOF 2017a)

Aspects of the operation are also managed as per Ministerial policy guidelines and other policy papers including Administrative Guidelines Nos. 1 and 2 and the translocation policy.

A summary of all the management controls in place for the WAEGAF (which includes the hatchery and the grow out operation), as a combination of the primary and subsidiary legislation and policies is described below.

Measure	Description	Instrument
Authorisation-Licence	An aquaculture licence provides the authorisation to conduct the activities for a prescribed species, method and location subject to conditions.	Section 92 FRMA
Spatial Area - Lease	A lease is required to use an area for aquaculture. For sea based, the site must be marked unless all gear is at a depth greater than 5 metres below the lowest tide. For land based, a legal right to use the site is required (e.g., land lease)	FRMA. DPIRD/DoT marking and lighting for Pearling and Aquaculture leases document. Land Administration Act 1997.
Method and Gear	Abalone are only to be cultured on grow-out structures on the sea floor. no more than 15,000 grow-out structures may be used at any one time, any structure used must have a total surface area (not including the base) of < 10 m <sup>2</sup> and structures must be constructed of concrete materials sourced from a supplier in Australia. No feed or substances to be used for sea-based site.	Licence conditions
Source of Stock	Abalone must only be stocked at the site if they have been sourced from an authorised hatchery	Licence condition
Broodstock	Restricted to number and species. Records to be kept and broodstock are to be kept in a quarantine area.	Section 7 Exemption, Licence condition
Health management	A health certificate is required for all abalone being moved from a land-based facility and confirmation provided by the Principal Research Scientist Fish Health. A copy of the health certification must accompany the abalone being moved at all times.	Licence conditions
Stocking density and biomass	Abalone must not be cultured at a density that exceeds a biomass of 3 kg whole weight / m <sup>2</sup> of grow-out surface. The licence holder must comply with an R&D plan to be agreed between the licence holder and DPIRD.	Licence conditions

Monitoring	Site inspections for disease and mortalities. Dead abalone must be collected and preserved and sent to DPIRD for testing. Sediment quality monitoring program.	MEMP, Licence condition
Reporting	Monthly aquaculture productions returns must be submitted to the Department. An annual MEMP report and records such as movement and numbers of grow-out structures and abalone (including mortalities) must be kept.	Reg 64 FRMR, MEMP, Licence condition
Processing	Abalone must not be processed on the site or at sea and must remain in the shell until delivered to a licensed processing facility. Consignment notes must be completed and securely attached to abalone containers when being transported.	Licence conditions
Boat restrictions	Boats used are exclusively for aquaculture activities and only those boats nominated on the licence may be used.	Licence conditions
Biosecurity	Must report mortalities and signs of disease and provides reports and samples as requested. Maintain a sentinel population at the hatchery.	Regulation 69 FRMR, Licence condition, MEMP (include the biosecurity plan)

## Decision Making Processes

There is an established fishery-specific management system decision-making process in place that results in measures and strategies to ensure management objectives are met in the longer term. The process is set out in legislation and policies and is triggered mostly as a result of analysing longer-term patterns in fishery performance or variations in the operating environment caused by other factors (e.g., environmental conditions, market forces, fishing behaviour, conflicts with other sectors etc.). The updated ERA was conducted in October 2021 which included the enhanced fishery component. Outcomes from ERAs are also used to inform decisions on fisheries where high risks are identified (e.g., research required to fill knowledge gaps).

Examples of management system decision making processes prescribed in legislation and policies relevant to this assessment include:

- Under s.92(1) of the FRMA, the CEO may grant an aquaculture licence to a person if satisfied that the person is fit and proper to hold an aquaculture licence; the person has, or will have, appropriate tenure over the land or waters on or in which the activities under the licence are to be conducted; it is in the better interests of the State and the community to grant the licence; the proposed activities are unlikely to adversely affect other fish or the aquatic environment; and, the proposed activities have been approved by other relevant authorities.
- Under s.97 of the FRMA, the Minister may grant aquaculture leases subject to the same criteria as above being met. Administrative Guideline no 1 outlines the assessment and decision making process for authorisations in coastal waters (DPIRD 2017c).
- The Minister for Fisheries, CEO or delegate may grant an Exemption under s. 7 of the FRMA for purposes such as research and development, broodstock collection or another purpose that is subject to a prohibition.
- For aquaculture leases in marine parks, prior to variation or grant, approval must be sought from the Minister for Environment. Similarly, for matters of importance to the Environmental Protection Authority, the proposal must be referred to them.
- *Ministerial Policy Guideline No. 19 Matters of Importance in Respect of the "Fit and Proper Person" Criterion For Authorisations Under The Fish Resources Management Act 1994* ("MPG 19") provides a description of the types of considerations relevant to the "fit and proper person" criterion by reference to the key concepts of knowledge, honesty and ability.
- Closure of Area 3 for the taking of greenlip under the Abalone Management Plan in response to declining stocks.
- Decisions in the form of control rules are outlined in the abalone resource harvest strategy (DPIRD 2022)

Decision making processes for other parts of the management system are not as transparent. For example, determination of the number of animals to be collected under the broodstock exemption and how the wild fishery and recreational fishery are considered within this allocation.

## Monitoring, Control and Surveillance

The FRMA provides a wide range of compliance powers and controls relating to entry, search, inspection, seizure, arrest, prosecution, forfeiture and penalties, including imprisonment. These powers are exercised by Fisheries Officers appointed under the relevant legislation.

### *Compliance Strategy*

Compliance planning and implementation in WA fisheries is directed by the Western Australian Fisheries Compliance Strategy (the Compliance Strategy) which has been developed to: *"provide an understanding*

of the principles underlying the Department's compliance role and how its compliance services are delivered to the Western Australian community". The Strategy aligns with, and complements, the Department's Compliance Framework and Risk Assessment Policy which informs the risk-based model, compliance planning and the governance structure applied to fisheries compliance services.

The Department's compliance model is based on the Australian Fisheries National Compliance Strategy 2016-2020 (National Strategy). Senior compliance fisheries practitioners across Australia and New Zealand were consulted in the production of the National Strategy.

The Department's compliance program promotes three key compliance strategies recommended by the National Strategy: (1) maximising voluntary compliance; (2) effective deterrence; and (3) organisational capability and capacity.

#### *Enforcement tools and their application*

A set of enforcement tools and sanctions exist and may be taken in respect to offenders under Fisheries legislation:

- Infringement Warning Notice – involves issuing a written warning in lieu of a penalty;
- Infringement Notices – involves a penalty;
- Letter of Warning – a written warning in lieu of a prosecution; and
- Prosecution – instigation of legal proceedings and/or proposed court action.

In addition to these enforcement tools, Fisheries Officers also have the power to seize fish and fishing gear that on reasonable grounds is believed to be the subject of or used in the commission of an offence. Likewise, Fisheries Officers may seize any item where the item may afford evidence of the commission of an offence.

The compliance program deploys a wide range of tools to encourage compliant behaviour with the Department's control measures, ranging from encouraging voluntary compliance through educative means, through to the use of sophisticated compliance tools such as covert surveillance and covert operations. The Department also has a Fishwatch number where illegal fishing can be reported, and intelligence collected.

#### *Resourcing compliance*

The Department has a regionalised compliance model to support the need for a compliance presence statewide. Four compliance regions have been defined: Northern; Gascoyne Mid-West; Metropolitan; and Southern. Regional compliance staff operate from four regional and 13 district offices. Within these regions, Fisheries Officers and Community Education Officers are generally located in coastal towns. Further support is provided by Perth-based specialist compliance units which provide intelligence, prosecution, surveillance and investigation, training, quality control and governance services.

Fisheries Officers raise community awareness and provide advice, in relation to:

- liaise with the fishing and marine industry, community groups, volunteer organisations, clubs, the public and other government agencies and advise on fisheries matters;
- the public and other government agencies and advise on fisheries matters;
- provide advice and assist with the effective delivery of volunteer programs if required; and
- promote fisheries initiatives and messages through liaison, presentations and provision of advice.

Fisheries Officers also lead compliance actions, including:

- undertake inspections, investigations and enforce legislation;
- plan and lead patrols, issue notices and infringements; and

- apprehend and prosecute offenders, seize illegal equipment and evidence as authorised.

Compliance resources are allocated in accordance with the Regional Services Division's Compliance Framework and Risk Assessment Policy.

*Compliance risk assessments and Operational compliance for the WAEGAF*

Wild fisheries are subject to compliance risk assessments every 1 – 2 years in major fisheries (such as the Abalone Managed Fishery) or those perceived to be at high risk and every 3 – 5 years in minor fisheries. The risk assessment process is a significant input into the development of an Operational Compliance Plan (OCP) for the fishery, which provides the formal framework for the delivery of specific compliance services that remove or mitigate those identified risks.

Enhanced fisheries such as the WAEGAF are subject to biannual inspections for compliance with licence conditions and MEMP requirements. Biosecurity audits at the hatchery against the Abalone Health Accreditation Program are also regularly conducted by DPIRD staff.

## Review and Evaluation of Management

There is no clear system for monitoring and evaluating the performance of the hatchery or grow out site that make up the WAEGAF except for the submission of aquaculture production returns and monitoring of compliance with some licence conditions such as stocking density through annual biomass surveys. Whether the annual MEMP or Exemption reports are submitted and used by management to monitor and evaluate the fishery is yet to be determined. This is no evidence to demonstrate that the long-term objectives outlined in the MEMP are being assessed as to whether they have been achieved or not.

The fishery specific management system is subject to internal and external reviews. For example, licence conditions on aquaculture licences generally are currently being reviewed and updated. The MEMP has been revised and update several times and it now at version 8. Most recently, the MEMP was revised following an evaluation of results from the monitoring program (sediment) and it includes a review provision. External reviews include:

- The 2009 ACWA Abalone Environmental Code of Practice was reviewed and revised by the then WA Abalone aquaculture Association, Aquaculture Development Council and ACWA in 2013.
- The risk assessment for abalone enhancement or marine grow-out was independently reviewed (Jones and Fletcher 2012).
- Annual reviews are done by DBCA on the implementation of the Ngari Capes Marine Park management plan.
- The Marine Parks and Reserves Authority audits management plans to assess the effectiveness of management.
- The 2015 ERA report for the abalone managed fishery was external reviewed (Webster et al. 2017).

**7.4.2 Principle 3 Performance Indicator scores and rationales**

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	<b>The management system exists within an appropriate legal and/or customary framework which ensures that it:</b> <ul style="list-style-type: none"> <li>- <b>Is capable of delivering sustainability in the UoA(s);</b></li> <li>- <b>Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</b></li> <li>- <b>Incorporates an appropriate dispute resolution framework</b></li> </ul>			
	Scoring Issue	SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system <b>and a framework for cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <b>organised and effective cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and <b>binding procedures governing cooperation with other parties</b> which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

In accordance with the Offshore Constitutional Settlement 1995 (OCS) (Brayford and Lyon 1995), the WAEGAF and wild abalone stocks falls under the management jurisdiction of the WA Government. The WA Government provides management, licensing, research and compliance and education services for commercial fisheries, recreational fisheries, aquaculture and customary fishing.

The key legislative elements of the fisheries management system in WA are the FRMA, the FRMR and subsidiary legislation. Commercial fishing operations must also comply with the requirements of the *Western Australian Marine Act 1982*, the *Conservation and Land Management (CALM) Act 1984*, the *Biodiversity Conservation Act 2016* and the *Environmental Protection Act 1986* (where relevant).

These legislative instruments are supported by a range of high level policies including:

- The WA Government’s Fisheries Policy Statement (DoF 2012);
- DPIRD’s Strategic Intent 2018-2021 (DPIRD 2018a);
- DPIRD’s Aquaculture Development Plan (2020c);
- The Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DoF 2015); and
- Ecosystem Based Fisheries Management (as described in DPIRD 2020b).

The Minister for Fisheries is the responsible Minister in the WA Government and has legislative power to act upon knowledge and advice he is provided with. Administration of the management arrangements is the responsibility of the Deputy Director General (DDG) of the Department of Primary Industries and Regional Development (DPIRD). DPIRD is governed by the *Public Sector Management Act 1994*, which requires, among other things, that DPIRD provide an Annual Report to Parliament that includes an assessment of the extent to which the Department has achieved its goal of conserving and sustainably developing the State’s aquatic resources (e.g., DPRID, 2020a).

Given the WAEGAF is located in the general use zone of the Ngari Capes Marine Park (established under the CALM Act), cooperation between government bodies that have responsibilities in the region is required (i.e., DPIRD and the Department of Biodiversity, Conservation and Attractions (DBCA)). To

facilitate this a memorandum of understanding was developed between the Minister for Fisheries and the Minister for Environment to establish principles of cooperation and integration between the Departments in the management of the state’s marine parks and reserves. Collaborative operational plans have been developed to ensure the efficient delivery of a range of programs where there is shared responsibility such as patrol and enforcement, research and monitoring.

There is an effective legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2. The fishery meets the requirements of SG 60, 80 and 100.

Resolution of disputes				
<b>b</b>	Guide post	The management system incorporates or is subject by law to a <b>mechanism</b> for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes which is <b>considered to be effective</b> in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

There are several mechanisms within the management system that may be used for the resolution of legal disputes:

- Changes to existing or new fisheries legislation, including subsidiary legislation such as Fishery Management Plans, are potentially subject to review through the disallowance process of State Parliament. All subsidiary legislation is also reviewed by the Joint Standing Committee on Delegated Legislation, which may seek further advice on the reasons for the legislation and potentially move to disallow. These processes provide for parliamentary and public scrutiny of all fisheries legislation.
- There are well-established formal dispute mechanisms for administrative and legal appeals of decisions taken in respect to fisheries (contained in Part 14 of the FRMA).
- Most decisions made by the DDG of the DPIRD and disputes regarding the implementation and administration of fisheries legislation can be taken to the Western Australian State Administrative Tribunal (SAT) for review, or to the WA (and Commonwealth) Court System. The main objective of the SAT in dealing with matters within its jurisdiction are to achieve the resolution of questions, complaints or disputes, and make or review decisions, fairly and according to the substantial merits of the case. The decisions of the SAT and Courts are binding on DPIRD, and all SAT decisions must be carried out by the Department (under section 29(5) of the State Administrative Tribunal Act 2004). These mechanisms have been used and tested for several fisheries and outcomes considered to be effective (see the decisions database here).
- A specific example is FRMA s.148, which requires that before giving effect to a decision to transfer an aquaculture licence the CEO must publish notice of that decision on the DPIRD website. The CEO must allow 28 days for any affected person to make an application for review of the decision by the SAT.
- Disputes in the fishery are also informally avoided or addressed through a system of ongoing communication and consultation processes between the fishery’s management and research staff and industry.

- Appeals can be lodged against decisions made by the EPA which are investigated by the Appeals Convenor and determined by the Minister for Environment.

The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective. The fishery meets the requirements of SG 60, 80 and 100.

Respect for rights				
C	Guide post	The management system has a mechanism to <b>generally respect</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>observe</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>formally commit</b> to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The Commonwealth *Native Title Act 1993* provides the means by which the Australian legal system recognises the traditional rights and interests of Aboriginal and Torres Strait Islander people. This legislation provides a mechanism for the making of binding decisions about native title rights to areas of land and water and thereby ensures access to fish resources for people who depend on fishing for their food.

The rights of Aboriginal persons fishing for customary purposes are recognised under Section 6 of the FRMA and S258(1)(ba) of the Act provides the power to make regulations to manage customary fishing. In addition, the Western Australian Government has developed a Customary Fishing Policy (DoF 2009a) which acknowledges the importance of customary fishing to the continuing Aboriginal cultures in Western Australia, and to ensures a comprehensive and sustainable integrated fisheries management framework.

The State’s Integrated Fisheries Management (IFM) policy (DoF 2009b) seeks to share resources between fishing sectors i.e., commercial, recreational and customary. The Aquatic Resources Management Act 2016 (which will ultimately replace the FRMA when enacted) establishes the ability for a quantity of an aquatic resource to be reserved for conservation and reproductive purposes before setting a sustainable harvest level for by the fishing sectors. It is proposed that this ‘reserve’ include an allowance for customary fishing, where appropriate.

In 1992, the High Court of Australia recognised native title, i.e. that indigenous Australians may continue to hold native title and to be uniquely connected to the land. Australian law recognises that native title exists where Aboriginal people have maintained a traditional connection to their land and waters, since sovereignty, and where acts of government have not removed it. A 2013 High Court decision concluded that State fisheries legislation in South Australia did not extinguish native title rights to fish. It is likely that this decision also means that WA fisheries legislation does not extinguish native title rights to fish where that right is exercised for a traditional, non-commercial purpose by an Aboriginal person.

With regard to sea-based aquaculture leases, the lease area provides for non-exclusive use of the sea-bed which means others may enter the lease area and fish provided they do not interfere with aquaculture equipment or product.

There are several mechanisms that formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. The fishery therefore meets the requirements of SG 60, 80 and 100.

## References

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Draft scoring range

**≥80**

Information gap indicator

**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

PI 3.1.2 – Consultation, roles and responsibilities

<b>PI 3.1.2</b>		<b>The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</b>		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Roles and responsibilities</b>			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>generally understood.</b>	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for key areas</b> of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for all areas</b> of responsibility and interaction.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Rationale</b>				

There are several organisations involved in parts of the management of fisheries generally and an enhanced fishery such as Rare Foods Australia.

The FRMA sets out the roles and responsibilities of the WA Government in relation to the management of Western Australian fisheries.

Within the State Government, the key roles and responsibilities are well described and understood:

- DPIRD provides management, licensing, research and compliance and education services for commercial fisheries, recreational fisheries, customary fishing, pearling and aquaculture in all State waters (including marine parks) and the fish processing and charter boat industries.
- The Minister for Fisheries has legislative power to turn knowledge and advice he is provided with into action, while the administration of these management arrangements is the responsibility of the DDG of the Department, and the Department more generally.

DPIRD is structured around three key service delivery areas:

- Aquatic Management: provides management, policy development, licensing and legislation related to the State’s commercial and recreational fisheries, pearling, aquaculture, fish processing, the charter boat industry, customary fishing and protection of aquatic ecosystems;
- Compliance and Education: provides state-wide fisheries compliance and community education, in accordance with the provisions of relevant legislation; and

- **Research and Monitoring:** provides timely, quality scientific knowledge and advice to support the conservation and sustainable use of the State’s fish resources and aquatic systems.

The roles and responsibilities of each of these areas are outlined in more detail in the DPIRD’s Annual Report to Parliament (DPIRD, 2020a).

WAFIC is the peak industry body representing professional fishing, pearling and aquaculture enterprises, as well as processors and exporters in WA. WAFIC is an incorporated association, created by the industry more than 40 years ago to work in partnership with Government to set the directions for the management of commercial fisheries in WA. WAFIC plays a central role in the management system of commercial fisheries as the Government’s principle source of coordinated advice from the commercial fishing industry. A Service Level Agreement with DPIRD formalises and outlines WAFIC’s consultation roles and responsibilities and interactions with DPIRD. The Aquaculture Council of WA is a sector body within WAFIC and has some consultation functions as required.

WAFIC’s responsibilities include coordinating Government funding for industry representation and taking on a leadership role for matters which involve or impact on or across a number of fisheries, or are of an industry-wide or generic nature. WAFIC also represents those commercial fishing sectors that do not have capability of self-representation.

The Environmental Protection Authority has statutory obligations under Part IV of the EP Act 1986 to conduct environmental impact assessments. The role and functions of the EPA are broad but explicit and includes protection of the environment and to prevent, control and abate pollution and environmental harm through conducting environmental impact assessments, preparing policies for environmental protection, publishing guidelines for managing environmental impacts and providing strategic advice to the Minister for Fisheries (EPA - The role of the EPA | EPA Western Australia ).

The Department of Biodiversity, Conservation and Attractions (DBCA) has responsibilities under the *Conservation and Land Management Act 1984* and, in the context of this assessment, is responsible for biodiversity conservation through marine parks and ensures safety of marine mammals and birds in the vicinity of aquaculture operations.

The roles and responsibilities of authorities and government agencies in relation to the Ngari Capes Marine Park are explicitly defined in the management plan and well understood by the relevant parties including through the development of MOUs and collaborative operational plans so that the areas of responsibility and interaction are clear (DEC 2013). Similarly, the Department of Transport (DoT) is responsible for ensuring the aquaculture industry does not adversely affect the safe operation of the maritime industry in coastal waters. It is the role of the DoT to ensure that the licensing process takes into account issues such as marking and lighting of aquaculture leases for example.

The roles of the various Government Departments involved in the management system are also clearly identified in ACWA’s Abalone Environmental Code of Practice (ACWA 2013).

Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. The fishery, therefore, meets the requirements of SG 60, 80 and 100.

Consultation processes				
<b>b</b>	Guide post	The management system includes consultation processes that <b>obtain relevant information</b> from the main affected	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information,	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information,

		parties, including local knowledge, to inform the management system.	including local knowledge. The management system demonstrates consideration of the information obtained.	including local knowledge. The management system demonstrates consideration of the information and <b>explains how it is used or not used.</b>
Met?	<b>Yes</b>		<b>Yes</b>	<b>Yes</b>
Rationale				

Consultation processes in the management system include:

- The WA Government’s commitment to consultation with stakeholders is stated in the Government’s Fisheries Policy Statement (2012) which specifies that WAFIC and Recfishwest are the key sources of coordinated industry advice for the commercial and recreational fishing sectors respectively. Under Service Level Agreements, these two peak sector bodies work in partnership with DPIRD to ensure adequate consultation is conducted with their constituents on broad or fishery/specific species policy issues.
- The FRMA requires the Minister to consult with ‘affected persons’ (commercial licence holders) when developing a new Management Plan or amending an existing plan (Sections 64 and 65, FRMA) such as the Abalone Management Plan.
- Management Meetings are held with licence holders in managed fisheries throughout WA. These meetings provide an opportunity for fishers, managers and researchers to discuss and exchange information on the fishery. Similarly, harvest strategy working group meetings for the abalone resource harvest strategy review have been held in regional locations such as Augusta and Esperance to ensure local knowledge is considered.
- DPIRD seeks public comment on research, management and discussion papers from time to time (e.g., final draft Aquaculture Development Plan).
- The Department published its Stakeholder Engagement Guidelines in August 2016, which outlined the processes through which the Department is to provide opportunities for all interested and affected parties to be involved (DoF, 2016).
- DPIRD has created a public comment space on its website (see website here), which provides for interested and affected parties to view information and make submissions on draft documents released for public.
- Administrative Guideline No 1 (AG1) *Assessment of Applications for Authorisations for Aquaculture and Pearling in Coastal Waters of Western Australia* sets out the assessment process for aquaculture proposals in the aquatic environment within WA. Applications to grant or vary aquaculture licences are advertised on the Fisheries website to seek public comment (DPIRD 2017c). This process considers inputs from a wide range of stakeholders including government departments (e.g., EPA and DoT where relevant) which may have an interest in the location, competing interest groups such as commercial and recreational fishermen (through WAFIC and Recfishwest respectively) and conservation groups, tourist groups and local residents where relevant.
- Under AG1, the DPIRD provides the applicant with copies of all submissions received to provide an opportunity for the applicant to respond and make any amendments if necessary. When all advice is available, including approvals from relevant decision-making authorities, Fisheries prepares a statement of decision and the chief executive officer (CEO) will determine the application. Written advice is provided to the applicant, including advice on any issues raised during the assessment process and the decision to proceed is advertised. All persons or bodies

who made submissions will be advised by email that information regarding the decision (with any information considered confidential having been redacted) is available on the Fisheries website. The advertised statement of decision explains the information that was used and not used in the decision-making process.

- Specific examples of consultation processes that are relevant to the GAEF are:
  - Amendments to the WAEGAF’s lease area in 2016 was put through the full process outlined in the policy and explained above.
  - The proposed new lease area was referred to the EPA who decided that the proposal did not need to undergo the environmental impact assessment process, but the EPA provided some advice for the other relevant decision-making authorities. This public advice is available on the EPAs website and documents the information that was considered, provides advice and explains why the proposal does not require assessment under Part IV of the *Environmental Protection Act 1986* (EPA 2013).
  - Recently, the aquaculture management officer consulted with the Fisheries Science and Resource Assessment Division of DPIRD and the Department of Biodiversity, Conservation and Attractions (DBCA) due to the location of the WAEGAFs sites within the Ngari Capes Marine Park prior to approval to amend the MEMP to reduce sediment monitoring.
  - Consultation with stakeholders for exemption applications or variations is often ad hoc depending on the location and issue. For example, the Southern Ports Authority were consulted regarding a research exemption variation in the Esperance area.

The management system includes consultation processes that seek and accept relevant information. There are some examples of what information was used and therefore, meets the requirements of SG 60, 80 and 100.

<b>Participation</b>			
<b>C</b>	Guide post	The consultation process <b>provides opportunity</b> for all interested and affected parties to be involved.	The consultation process provides <b>opportunity and encouragement</b> for all interested and affected parties to be involved, and <b>facilitates</b> their effective engagement.
	Met?	<b>Yes</b>	<b>Yes</b>
<b>Rationale</b>			

There are both statutory and non-statutory consultation processes in place that provides opportunity for involvement in the management of fisheries. In particular, the legislation requires that the Minister consult with respect to changes to Management Plans (e.g., Abalone Management Plan) and Administrative Guidelines Nos 1 and 2 requires DPIRD to advertise applications to grant or vary (depending on the extent of the variation) aquaculture licences and leases in coastal waters on the website to see public comment.

The Department has implemented a number of mechanisms to ensure that stakeholders have an opportunity to engage:

- Management Meetings (annual or biennial depending on the commercial fishery) are sometimes open to other stakeholder groups such as Recfishwest, processors, universities, other government departments and the conservation sector. However, details of these upcoming meetings are not made available to other stakeholders (e.g. on a website) nor are the outcomes of the meetings.

- In August 2016, the Department published its Stakeholder Engagement Guidelines which outlined the processes through which the Department will provide opportunities for all interested and affected parties to be involved (DOF, 2016). The Stakeholder Engagement Guidelines set out the overarching processes through which the Department seeks out relevant information from, and involvement by, stakeholders and interested parties on proposals relating to the management of WA's aquatic resources. The guideline focuses on commercial and recreational fisheries rather than aquaculture or enhanced fisheries.
- In the drafting of the Aquaculture Development Plan, DPIRD made the draft plan available for public comment and the Board of ACWA was consulted during its development.
- In early iterations of the Abalone Aquaculture Policy (DPIRD 2010), stakeholder meetings with the abalone industry (the wild capture and aquaculture sectors) were convened to discuss policy changes that would support the industry.
- The DPIRD and WAEGAF conducts external communications through social media such as Facebook, Instagram and Twitter accounts and well as on their respective websites.
- DPIRD has created a public comment space on its website (<http://www.fish.wa.gov.au/About-Us/Public-Comment/Pages/default.aspx>), which provides for interested and affected parties to view information and make submissions on draft documents released for public.
- It is noted that the most recent 2015 Environmental Risk Assessment (ERA) workshop conducted for the wild abalone fishery contained aspects of the enhanced fishery (Webster et al. 2017). A wide range of diverse stakeholders were invited and attended the workshop and given the opportunity for input. The reports that resulted from the ERA workshops were not open to any form of comment. The ERA held in October 2021 also included invitations to a wide range of stakeholders and extended the scope to include the enhanced (hatchery and ranching component) fishery. Participants will have an opportunity to review the draft report (DPIRD, 2022).

There are significant opportunities for industry sectors to be involved and engaged in the fishery's management. There are some opportunities provided for non-industry sectors to be involved. SG 80 is met. The WAEGAF encourages all interest groups to be involved by offering tours of the facility. The assessment team witnessed these tours which included information on the fishery and the operations and provided an opportunity for attendees to ask questions. The fishery, therefore, meets the requirements of SG100.

## References

ACWA (2013). Environmental Code of Practice for the sustainable management of Western Australia's abalone aquaculture industry.

DEC (2013). Ngari Capes Marine Park management plan 2013-2023. Management plan number 74. Department of Environment and Conservation, Perth.  
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DPIRD (2020a). Annual Report to Parliament 2020, Department of Primary Industries and Regional Development. <https://www.dpird.wa.gov.au/sites/default/files/2020-10/DPIRD%20Annual%20Report%202020%20-%20PDF.pdf>

DPIRD (2017c). Administrative Guideline No. 1. Assessment of Applications for Authorisations for Aquaculture and Pearling in Coastal Waters of Western Australia. [http://www.fish.wa.gov.au/Documents/administrative\\_guideline/ag001.pdf](http://www.fish.wa.gov.au/Documents/administrative_guideline/ag001.pdf)

DPIRD (2010). Abalone Aquaculture in Western Australia Aquaculture Policy. Fisheries Management Paper No. 242. fmp242.pdf (fish.wa.gov.au)

EPA (2013) s38 public advice 25 Nov 13\_0.pdf (epa.wa.gov.au)

Webster, F. J., Wise, B. S. and Hart, A. (2017). Ecosystem-Based Fisheries Management Risk Assessment of the Western Australian Abalone Managed Fishery. Department of Fisheries, WA. 116 pp.

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>More information sought</b> <ul style="list-style-type: none"> <li>• WAEGAF engagement with the local community and other industry partners</li> </ul>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

### PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy for the SMU and associated enhancement activities has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are <b>implicit</b> within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are <b>explicit</b> within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are <b>explicit</b> within <b>and required by</b> management policy.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The long-term objectives of the management system are specified in the FRMA (see section 3.5.4) and are consistent with the MSC Principles and Criteria. The objects of the FRMA under section 3 are:

- (a) to develop and manage fisheries and aquaculture in a sustainable way; and
- (b) to share and conserve the State’s fish and other aquatic resources and their habitats for the benefit of present and future generations.

The FRMA sets out that the two primary objects will be achieved, in particular, by the following means including, but not limited to:

- (a) conserving fish and protecting their environment; and
- (b) ensuring that the impact of fishing and aquaculture on aquatic fauna and their habitats is ecologically sustainable and that the use of all aquatic resources is carried out in a sustainable manner.

Section 4A of the FRMA requires that the precautionary principle be applied in exercising functions or powers under the Act.

The long-term objectives are reflected in DPRID's Strategic Intent 2018-2021 document (DPRID 2018a) which outlines the following goals:

- Protect - To manage and provide for sustainable use of our natural resources and soils, and to protect Western Australia's brand and reputation as a reliable producer of premium, clean and safe food, products and services.
- Grow - To enable the primary industries sector and regions to increase international competitiveness, and grow in value and social amenity, strengthening these key pillars of the State's economy.
- Innovate - To support a culture of scientific inquiry, innovation and adaptation across primary industries and regions to boost industry transformation, economic growth and employment.

The Strategic Intent document also includes fisheries specific initiatives and targets for fisheries:

- Sustainable fisheries management - WA benefits from sustainable fisheries that support and optimise social, economic and environmental outcomes
- Natural resource management planning and assessment - WA's natural resources are sustainably used and managed using a sound risk-based planning and assessment approach, incorporating partnerships with traditional landowners and custodians.

The legislative long-term objectives are translated into clearly-defined operational arrangements and procedures for commercial resource/fisheries in the form of harvest strategies (see Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia (DOF, 2015)).

The Ngari Capes Marine Park Management Plan 2013-2023 contains long term objectives for commercial fishing and aquaculture in the marine park (DEC 2013). These are:

- To ensure that, in collaboration with the industry and DoF, commercial fishing activities and aquaculture in the marine park are managed in a manner consistent with maintaining the marine park ecological values while providing opportunities for social and economic benefits; and,
- To maintain ecological values of the marine park important to commercial fisheries and aquaculture.

The available evidence indicates that clear long-term objectives that guide decision making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy. The fishery, therefore, meets the requirements of SG 60, 80 and 100.

## References

DEC (2013), Ngari Capes Marine Park management plan 2013– 2023, Management plan number 74. Department of Environment and Conservation, Perth. 20120471-ngari-capes-marine-park-mp-74-2013-2023-v10.pdf (dpaw.wa.gov.au)

DOF (2015). Harvest Strategy Policy and Operational Guidelines for the Aquatic Resources of Western Australia. Fisheries Management Paper No. 271. Department of Fisheries, Western Australia.

DPIRD (2018a). DPIRD Strategic Intent. <https://dpiird.wa.gov.au/our-strategic-intent>

<b>Draft scoring range</b>	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	<b>NA</b>

### PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific and associated enhancement management system(s) activities have clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Objectives			
	Guide post	<b>Objectives</b> , which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are <b>implicit</b> within the fishery and associated enhancement management system(s).	<b>Short and long-term objectives</b> , which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are <b>explicit</b> within the fishery and associated enhancement management system(s).	<b>Well defined and measurable short and long-term objectives</b> , which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are <b>explicit</b> within the fishery and associated enhancement management system(s).
	Met?	<b>Yes</b>	<b>Partial</b>	<b>No</b>
Rationale				

For the purpose of this performance indicator the specific fishery is the WAEGAF which is managed by the Aquaculture section of DPIRD. The existence and nature of the objectives within each of the elements of the fisheries specific management system are considered below.

In terms of the reliance of the WAEGAF to the wild stock harvest from the commercial abalone fishery resource for broodstock purposes, the long-term ecological objectives of the Abalone Managed Fishery (AMF) are defined in the Harvest Strategy (DoF 2017b) as follows:

- Ecological Sustainability:
  - a. To maintain spawning stock biomass of each target species at a level where the main factor affecting recruitment is the environment.
  - b. To ensure fishing impacts do not result in serious or irreversible harm to bycatch species populations.
  - c. To ensure fishing impacts do not result in serious or irreversible harm to ETP species populations.

- d. To ensure the effects of fishing do not result in serious or irreversible harm to habitat structure and function.
- e. To ensure the effects of fishing do not result in serious or irreversible harm to ecological processes.

The above long-term management objectives are operationalised as short-term (e.g. annual) objectives in the harvest strategy but these are directly relevant to the wild sector only. Following internal consultation, the number of abalone allocated under the hatchery broodstock exemption instrument was based on current stock status and that it may change if there is a decline in stocks. Nonetheless, these long-term objectives are consistent with MSC Principles 1 and 2 and may be considered implicit within the fishery and associated enhancement management system due to the wild stock connection with the fishery.

The Abalone Aquaculture Policy (DoF 2017a) objectives are to:

- Establish the management measures that will apply to the abalone aquaculture sector;
- Provide clear guidance to applicant on key issues that will be considered in the assessment process for applications to grant or vary authorisations for abalone aquaculture licences and leases; and,
- Provide for the development and future growth of a sustainable abalone aquaculture industry in Western Australia.

The last of these long-term objectives, in the context of DPIRD’s EBFM framework, are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2 and are explicit within the fishery and associated enhancement management system.

There are also a range of long-term environmental objectives outlined in WAEGAF MEMP that explicitly cover outcomes associated with principle 2. These include:

- To avoid adverse impact on biological diversity, comprising the different plants and animals and the ecosystems they form, at the levels of genetic diversity, species diversity and ecosystem diversity.
- To maintain the integrity, ecological functions and environmental values of the seabed and coast.

The above objectives were developed when assessing potential risk to environmental factors including marine mammals, invertebrates, seagrass and macroalgae communities and sediments and fish abundance and distribution.

Management objectives exist in several management documents as outlined above. Hence SG60 is met. Some of these long-term objectives are explicit within the management system, however there are no fishery-specific short term objectives and hence SG 80 is only partially met.

References

DoF (2017a) Abalone Aquaculture in Western Australia. Principles and considerations relating to management of abalone aquaculture in WA. Fisheries Occasional Publication No. 132. Department of fisheries, Western Australia

DoF (2017b). Abalone Resource of Western Australia Harvest Strategy 2016-2021. Fisheries Management Paper No. 283. Department of fisheries, Western Australia

<b>Draft scoring range</b>	<b>60-79</b>
Information gap indicator	<b>More information sought</b> Have short term objectives for the fishery been developed?

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>70</b>
Condition number (if relevant)	<b>7</b>

PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific and associated enhancement management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Decision-making processes			
	Guide post	There are <b>some</b> decision-making processes in place that result in measures and strategies to achieve the fishery-specific and enhancement objectives.	There are <b>established</b> decision-making processes that result in measures and strategies to achieve the fishery-specific and enhancement objectives.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				

The decision maker and the decision-making processes are prescribed in the FRMA for the grant of or variation to aquaculture licences by the CEO of DPIRD (section 92) and aquaculture leases (section 97(1)). The assessment and decision-making processes are also outlined in Administrative Guideline No. 1 and 2 (DPIRD 2017c).

There are established decision making processes under the *Environmental Protection Act 1986* where proposals that may have an impact on the environment and in doing so, potentially impact on one of the objectives of the EPA, which is to protect the environment, are referred to the EPA for assessment.

The abalone aquaculture policy outlines key principles that will be considered when assessing applications for abalone aquaculture using a risk-based approach and the precautionary principle. These principles provide guidance in decision making by DPIRD for organisations that include enhancement activities. The policy also outlines considerations that the CEO of DPIRD should take account of when making a determination to grant an aquaculture licence for abalone and in specifying conditions for abalone aquaculture licences.

Recently an amendment to the WAEGAF’s MEMP was approved to reduce the amount of sediment monitoring required. This amendment was approved on the basis that impacts were not detected at areas where abalone capacity was fully stocked. The regular monitoring demonstrated that any environmental impacts were minimal which aligns with the MEMPs long term objectives while a reduction in this requirement facilitates a more profitable aquaculture industry which aligns with long term objectives of the FRMA.

The Abalone resource harvest strategy contains explicit decision-making processes and harvest control rules to ensure the fishery specific objectives are achieved (DoF 2017b).

There are legislative powers that provide for a process that can be immediately triggered for fisheries related issues. Examples include the closure of areas under clause 16 (1) of the Abalone Management Plan 1992 (e.g., Area 3 prohibition of greenlip harvest this year), revocation of an instrument of exemption, variation or addition of licence conditions or the suspension of a licence. This meets the SG 60 and SG 80.

Responsiveness of decision-making processes				
<b>b</b>	Guide post	Decision-making processes respond to <b>serious issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to <b>serious and other important issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to <b>all issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

The assessment team notes examples of the responsiveness of the decision making processes to serious operational matters including:

- Closure of areas under clause 16(1) of the Abalone Management Plan 1992 (e.g. Area 3 prohibition of greenlip harvest this year)
- The Abalone Aquaculture Policy 2010 (FMP 242) was updated in 2013 to include advice on management measures to mitigate the risk of spread of the AVG virus into wild abalone populations. The advice on this serious issue was an outcome of an assessment of risk associated with the release of abalone sourced from abalone hatcheries for enhancement or marine grow-out in the open ocean (Jones and Fletcher 2012).
- The Abalone Aquaculture Policy of 2013 was updated in 2017 due to further research and knowledge gained in relation to biosecurity controls to allow for more flexibility in the areas of spatial separation, location of aquaculture gear and genetic management.
- A maximum grow-out density for greenlip was identified as part of the biosecurity strategy to minimise disease risk. The stocking density of 3 kg per m<sup>2</sup> was determined based on 10 years of surveys and comparisons with wild densities. This requirement was placed into a licence condition.
- A decision made by the Acting Deputy Director General Sustainability and Biosecurity in DPIRD was made in 2020 to revise the WAEGAF’s MEMP and downgrade the level of monitoring required from seasonal to 5 yearly based on results from the sediment nutrient surveys that showed no detectable impacts in the sediment surrounding the abitatats. Data from the 2015-2019 monitoring period were provided to support the decision and consultation was undertaken with DBCA.

These above issues have been identified through research, monitoring and consultation. Thus SG 60 is met.

The assessment team also notes that some important issues have not been addressed in a timely manner, for example, a broad policy position regarding predator protection across aquaculture leases which was raised in 2015 and the requirement for annual MEMP and Exemption reports to be submitted for evaluation has not been addressed (i.e. reports not being submitted). It is also unclear how decisions are made on the grant of Exemptions and what monitoring is done or how wider implications are taken into account (i.e. the impact on the wild fishery now greenlip stocks have been reduced and the numbers

allocated under the broodstock exemption have not been considered). There are some decisions that are not considered to be transparent, timely, or adaptive. Therefore, it is considered that SG 80 is not met.

Use of precautionary approach			
<b>C</b>	Guide post	Decision-making processes use the precautionary approach and are based on best available information.	
	Met?	Yes	
Rationale			

The abalone aquaculture policy has the precautionary approach at its core as a key principle (see section 3.2 from DoF 2017a). The precautionary approach is particularly used when decisions are made on the grant of leases and the extent of spatial separation between farms or productive reef areas. In addition, while ranching operations were not expected to alter nutrient levels (due to the nature of the operation with no added feed), a comprehensive sediment monitoring program was implemented initially as a precautionary response to test for accumulation of nutrients or organic matter in sediments near the abitat areas. Section 4A of the FRMA requires that the precautionary principle be applied in exercising functions or powers under the Act and there are examples on the use of the precautionary approach when making decisions. Thus SG 80 is met.

Accountability and transparency of management system and decision-making process			
<b>d</b>	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	<p><b>Information on the fishery's performance and management action is available on request,</b> and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p> <p>Formal reporting to all interested stakeholders <b>provides comprehensive information on the fishery's performance and management actions</b> and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>
	Met?	Yes	No
Rationale			

In accordance with s.148(1)(c)-(d) of the FRMA, before giving effect to a decision to grant, vary or transfer an aquaculture licence the CEO must cause notice of the decision to be published. The CEO will ensure that advertisements for either applications or decisions appear on the Fisheries website. In accordance with s.97(9) of the FRMA, if a lease is granted, the Minister is to cause notice of the grant to be published in the Gazette and thereby advising stakeholders of the decision.

In some cases, a statement of decision is published on the website (see an example here). The information includes comprehensive information on the information used and the response.

Both the MEMP and results of the sediment monitoring program are available for stakeholders to view on Rare Foods Australia’s website. This information provides stakeholders with some information on how the operation is regulated and performing in terms of impacts on sediments.

As a publicly listed company on the Australian Stock Exchange, formal annual reports are publicly available and provide information on total harvested production, sales and revenue, among other things (see Reports section within the Rare Foods Australia Ltd website). Therefore the SG 60 is met.

Other information is limited for this enhanced fishery. For example, DPIRDs State of the Fisheries annual publication does not provide figures for abalone production due to a limited number of producers and confidentiality provisions (Gaughan and Santoro 2020). The DPIRD Annual Report summarises all of the Exemptions that have been granted and for what purpose (DPIRD 2020) but there is no information on the actual activities conducted. An extract from the public register can be requested (for a fee) so any stakeholder can see who holds an aquaculture licence in an area and for what species, however there is no information on the fishery performance or management action. During this assessment, information on the broodstock used for juvenile production and subsequent stocking as well as reports against the MEMP and a broad policy on predator removal were requested and mostly unavailable. Therefore SG 80 and SG 100 is not met.

Approach to disputes				
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes
Rationale				

The transparent and inclusive nature of management and decision making, particularly through published policy documents, guidelines and applications for consultation, minimizes the likelihood of legal disputes. The assessment team is unaware of any legal challenges relating to this fishery. Therefore, SG 60, SG 80 and SG 100 are met.

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Draft scoring range	<b>60-79</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>75</b>
Condition number (if relevant)	<b>8</b>

### PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery and associated enhancement activities are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	MCS implementation			
	Guide post	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and associated enhancement activities and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and associated enhancement activities and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> monitoring, control and surveillance system has been implemented in the fishery and associated enhancement activities and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The Western Australian Fisheries Compliance Strategy (the Strategy; DPIRD 2018b) was published in 2018 with the purpose of outlining the principles underlying the DPIRD's compliance role and how its compliance services are delivered to the WA community, including the aquaculture sector.

The Strategy aligns with, and compliments, DPIRD's Compliance Framework and Risk Assessment Policy which informs the risk-based model, compliance planning and the governance structure applied to fisheries compliance services.

The Department's compliance model is based on the Australian Fisheries National Compliance Strategy 2016-2020 (the National Strategy). DPIRD's compliance program contains three key compliance strategies recommended by the National Strategy:

- maximising voluntary compliance;
- effective deterrence; and
- organisational capability and capacity.

Compliance mechanisms for the hatchery and the enhanced fishery focus on biosecurity in the hatchery facility and the grow-out site in the form of site inspections to ensure compliance with licence conditions, MEMPs and biosecurity plans. Biannual inspections are conducted on the enhanced fishery by trained Fisheries Officers. Consignment notes for movement of abalone and health certificates are inspected. Biomass surveys are completed by research staff every year to confirm compliance with stocking density conditions and to validate the fishery’s own internal six monthly ‘stocktake’ audits. DPIRD also has a FISHWATCH number for non-compliance and other issues to be reported and placed into the intelligence database Sea Star.

The assessment team sighted inspection reports and other required documentation and minimal non-compliance was observed. A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures and rules. The SG 60 and 80 are met. The MCS cannot be considered to be comprehensive as exemption conditions and all MEMP requirements are not checked, nor is there a compliance risk assessment or operational compliance plan in place for this enhanced fishery operation like there is for the wild sector. Hence SG 100 is not met.

Sanctions				
<b>b</b>	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

The FRMA contains an explicit sanction framework, including the nature and extent of sanctions to be applied to non-compliance with regulations. A tiered system of sanctions includes infringement warnings, infringement notices, letter of warning and prosecutions. Sanctions arising from prosecution can include monetary penalties, licence cancellations or suspensions and confiscation of gear or catch. The penalties are commensurate with the value of illegal fish and the type of illegal activity.

There have been no sanctions against the enhanced fishery as all identified issues were addressed before they became serious enough to warrant a warning or infringement (M. Hilyard pers. comm. 2021). However the wild abalone fishery (from where the broodstock is sourced) has received several sanctions recently. During 2019/20 there were 29 compliance contacts in the commercial greenlip/brownlip fishery which included one prosecution brief, one infringement and one warning. This meets SG 60. Even though there were more compliance contacts than the previous year, the number of offences detected in the wild fishery have reduced significantly which demonstrates that the sanctions provide an effective deterrence.

Sanctions to deal with non-compliance exist but there is no evidence that they are applied in the WAEGAF. It is therefore considered that SGs 80 and 100 are not met.

Compliance				
<b>c</b>	Guide post	Fishers and hatchery operators are <b>generally</b>	<b>Some evidence exists</b> to demonstrate fishers	There is a <b>high degree of confidence</b> that
	Met?	<b>No</b>	<b>No</b>	<b>No</b>

		<b>thought</b> to comply with the management system for the fishery and associated enhancement activities under assessment, including, when required, providing information of importance to the effective management of the fishery.	and hatchery operators comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery and associated enhancement activities.	fishers and hatchery operators comply with the management system under assessment, including, providing information of importance to the effective management of the fishery and associated enhancement activities.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>

Rationale

Compliance rates are generally high with breaches against licence and MEMP conditions (e.g. staff training) and MEMP reporting being the most prevalent in inspection reports. These issues were considered relatively minor and did not attract a sanction (M. Hilyard pers. comm. 2021). The assessment team noted the use of a boat to remove predators from the lease site does not align with the prescribed licence condition on this matter.

Information requirements for effective management include:

- Aquaculture production returns (s. 102 of the FRMA and Reg 64 of the FRMR) are submitted annually and data is validated. DPIRD confirmed that the hatchery and fishery are compliant.
- Exemptions for broodstock, research and development and predator removal have required an annual report. None of these have been completed and therefore not used to evaluate fishery performance.
- Annual reports of the MEMP requirements are required one month prior to the licence renewal date each year. A report from 2017 was submitted and included some aspects of the MEMP requirements but not all.
- There has been no internal audit conducted against the “ACWA Environmental Code of Practice for the Sustainable Management of WA’s Abalone Aquaculture Industry” as prescribed in the MEMP.

Fishers and hatchery operators are generally thought to comply with the management system and some information is provided. SG 60 is met. However, there are several other information requirements that are not being adhered to or addressed by management such as the submission of annual MEMP and exemption reports. Therefore SG 80 is not met.

<b>Systematic non-compliance</b>				
<b>d</b>	Guide post		There is no evidence of systematic non-compliance.	
	Met?		<b>Yes</b>	

Rationale

The level of detected offences from the hatchery and enhanced fishery is extremely low despite regular inspections and there is no evidence of systematic non-compliance and SG 80 is met.

References

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[https://www.fish.wa.gov.au/Documents/corporate\\_publications/fisheries\\_compliance\\_strategy.pdf](https://www.fish.wa.gov.au/Documents/corporate_publications/fisheries_compliance_strategy.pdf)

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>Information sufficient to score PI</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>70</b>
Condition number (if relevant)	<b>9</b>

### PI 3.2.4 – Monitoring and management performance evaluations

<b>PI 3.2.4</b>	<p><b>There is a system of monitoring and evaluating the performance of the fishery-specific and enhancement management system(s) against its objectives</b></p> <p><b>There is effective and timely review of the fishery-specific and associated enhancement program(s) management system</b></p>		
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Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Evaluation coverage			
	Guide post	The fishery and associated enhancement program(s) has in place mechanisms to evaluate <b>some</b> parts of the management system.	The fishery and associated enhancement program(s) has in place mechanisms to evaluate <b>key</b> parts of the management system.	The fishery and associated enhancement program(s) has in place mechanisms to evaluate <b>all</b> parts of the management system.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>

#### Rationale

There is no clear system for monitoring and evaluating the performance of the hatchery or grow out site that make up the WAEGAF. Fishery-specific objectives are not clearly defined and are only long term.. Monitoring and evaluation mechanisms appear ad hoc and there is no evidence of monitoring against the long term objectives.

While there is no aquaculture development plan in place for the WAEGAF, the aquaculture production returns and internal records are validated and used to evaluate the operators "objective of maximising productivity" (B. Adams pers. comm). Similarly, the MEMP was last amended in June 2020 to reduce the frequency of sediment monitoring based on results that indicated minimal impact and to support a viable aquaculture industry. Hence, SG 60 is met.

However, MEMPs and exemptions are key parts of the management system and are not evaluated. For example, the annual reporting requirements under these management instruments are not usually received and when they are, are not evaluated or used for monitoring by the DPIRD. DPIRD advised that there has been no recent evaluation of the compliance regime associated with this fishery. Therefore, SG 80 is not met.

### **b** Internal and/or external review

	Guide post	The fishery-specific and associated enhancement program(s) management system is subject to <b>occasional internal</b> review.	The fishery-specific and associated enhancement program(s) management system is subject to <b>regular internal and occasional external</b> review.	The fishery-specific and associated enhancement program(s) management system is subject to <b>regular internal and external</b> review.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

Rationale

There are several examples of internal and external reviews on aspects of WAEGAF management system. Internal reviews include:

- The Abalone Aquaculture Policy was first developed in 2013 and reviewed and updated by DPIRD in 2017 (DoF 2017a).
- The MEMP has had several revisions and the sediment quality program in the MEMP was last reviewed by the WAEGAF and DPIRD and updated in 2020.
- All licence conditions on aquaculture licences (excluding those on private land) are currently being reviewed and updated to reflect new reporting requirements and terminology, amongst other things. However, these conditions have not been reviewed regularly.
- The original 1998 policy guidelines for assessing aquaculture and pearling applications in coastal waters were updated and replaced in 2017 with Administrative Guidelines No 1.
- The abalone resource harvest strategy is currently undergoing its 5 yearly review with DPIRD and Industry members.

External reviews include:

- The 2009 ACWA Abalone Environmental Code of Practice was reviewed and revised by the then WA Abalone aquaculture Association, Aquaculture Development Council and ACWA in 2013.
- The risk assessment for abalone enhancement or marine grow-out was independently reviewed (Jones and Fletcher 2012).
- In the MEMP, the sediment quality program was reviewed by DBCA and updated in 2020.
- Annual reviews are done by DBCA on the implementation of the Ngari Capes marine park management plan.
- The Marine Parks and Reserves Authority audits management plans to assess the effectiveness of management.
- The 2015 ERA report for the abalone managed fishery was external reviewed (Webster et al. 2017).

Most parts of the management system are subject to regular (at least every 5 years) internal review. There are also several examples of occasional external reviews. Thus SG 60 and SG 80 are met. SG 100 is not met as there are some management measures that are not reviewed every five years. A recommendation to ensure that all of the key management policies and processes are reviewed on a regular basis may be applied.

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<b>Draft scoring range</b>	<b>60-79</b>
Information gap indicator	<b>More information sought</b> Are there any further evaluation or monitoring activities for this fishery?

Overall Performance Indicator scores added from Client and Peer Review Draft Report stage

Overall Performance Indicator score	<b>70</b>
Condition number (if relevant)	<b>10</b>

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## 9 Appendices

### 9.1 Assessment information

#### 9.1.1 Small-scale fisheries

Table 9 – Small-scale fisheries		
Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
1	80	100

## 9.2 Evaluation processes and techniques

### 9.2.1 Site visits

The Site Visit took place on the 29<sup>th</sup> - 30<sup>th</sup> November 2021 at the board room at Ocean Grown Abalone, Lot A – Augusta Marina, Leeuwin Road, Augusta, Western Australia.

The following agenda was circulated to participants:

<b>Day 1 – Monday 29<sup>th</sup> November 2021</b>			
<b>Augusta, WA 10:00 - 17:00 (18:00) WST</b>			
<b>Activity</b>	<b>Items to Review/Actions</b>	<b>People required/attending</b>	<b>Approx. Time</b>
Opening meeting	Introductions, Overview, Q&A re. documentation Audit plan	Audit team, client representatives	10.00 – 10.30
Principle 1	P1 updates (incl. new reference points and % for TACC; OGA and HS, SoM and Sb of OGA vs Flinders Bay population; Genetic strategy, released stock biomass vs wild biomass in Flinders Bay)	Research staff, client, audit team	10.30 – 13.00
<b>Lunch</b>			
Principle 2	P2 updates (incl. footprint of growout structures over time; main habitat types labelled/verified from aerial maps; recent incidental catch of lobster and octopus; analysis of algal biomass, predator removal impacts; results of released abalone monitoring over time; updated ERA)	Research staff, client, audit team	13:30 – 15:00
<b>Break</b>			
Principle 3	P3 updates (incl. short term fishery specific/ OGA objectives; mechanism to evaluate key parts of management system; decision-making process; compliance)  Traceability	Manager, client, audit team	15:30 -17:00
<b>Stakeholder meeting or finish</b>			
Stakeholder meetings		If requested	(17:00- 18:00) No meetings have been requested to date.

<b>Day 2 – Tuesday 30<sup>th</sup> November 2021</b>			
<b>Augusta, WA 8:30 - 13:00 WST</b>			
<b>Activity</b>	<b>Items to Review/Actions</b>	<b>People required/attending</b>	<b>Approx. Time</b>
Team scoring meeting		Audit team only	8.30 – 12.00
<b>Break</b>			
Closing meeting		Audit team, client representatives	12.30 – 13.00
<b>Lunch and team departure</b>			

### 9.2.2 Stakeholder participation

Stakeholder opportunities were outlined in the Announcement of the fishery on the MSC website on 27 September 2021 and a separate email advising of the Announcement and inviting participation was sent to all stakeholders on the list. Stakeholders were offered private interviews, but none were requested. No submissions from stakeholders were received during the public comment period on the ACDR or draft modified assessment tree.

The following people attended the site visit.

<b>Name</b>	<b>Role</b>	<b>Affiliation</b>
<b>Brad Adams</b>	Executive Corporate Development Director	RFA
<b>Joel Durell</b>	Ranch Manager	RFA
<b>Lachlan Strain</b>	Research	DPIRD
<b>Jodie O`Malley</b>	Management	DPIRD
<b>Nick Blay</b>	Management	DPIRD
<b>Mat Hilyard</b>	Compliance	DPIRD
<b>Matthew Hourston</b>	Research	DPIRD
<b>Sabine Daume</b>	Lead auditor, P2 expert	bio.inspecta Pty Ltd
<b>Klaas Hartmann</b>	P1 expert	Contractor/ bio.inspecta Pty Ltd
<b>Sascha Brand-Gardner</b>	P3 expert	bio.inspecta Pty Ltd

### 9.2.3 Evaluation techniques

The stakeholder list was assembled with assistance from the client and representatives. An allocated timeslot for meetings with stakeholders was provided for the site visit. In preparation for the site visit, the team requested personnel, with experience across all of the principles, make themselves available for questions from the assessment team.

The client and DPIRD submitted a checklist with links as well as references to relevant documents. Information continued to be collected during the site visit. Scoring was discussed by the assessment team during the site visit and the team agreed on a score (a consensus approach). Scoring was formally completed during the final preparation of the client draft report.

### 9.2.4 Modified assessment tree

The scope of the fishery contains greenlip abalone (*Haliotis laevis*) broodstock which are commercially harvested and relocated to a hatchery. The resulting juveniles are grown in a land-based facility before being transported to grow-out sites and released at Flinders Bay, Western Australia where they are grown on artificial habitat. There is no additional feed or nutrients used at the site besides naturally growing or drifting seaweed.

This scope is not covered in Annexes SB or SC, therefore we propose to include additional PIs in the assessment tree which will assess the impacts relative to genetics and translocation. Modifications to the default tree to add PIs as well as some word changes to the PIs were proposed and made available to stakeholders for review for the 60 days ACDR consultation period, However, no comments were received. The final tree was posted on the MSC website on the 1 December 2021 and provided in subsequent draft reports according to FCP v2.2 7.12.5i.

The additional PIs we are proposing to include are:

- PI 1.1.3; Genetics Outcome – weight: 0.333
- PI 1.2.5; Genetics Management – weight: 0.167
- PI 1.2.6; Genetics Information – weight: 0.167
- PIs 2.4.1-2.4.3 include “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PIs 2.5.1-2.5.3 include “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PI 2.6.1; Translocation component Outcome – weight: 0.333
- PI 2.6.2; Translocation component Management – weight: 0.333
- PI 2.6.3; Translocation component Information – weight: 0.333
- PI 3.1.3; “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PI 3.2.1; “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PI 3.2.2; “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PI 3.2.3; “enhancement activity” in PI wording – weight: 0.333 (unchanged)
- PI 3.2.4; “enhancement activity” in PI wording – weight: 0.333 (unchanged)

Justification: All of these PIs have been adapted from the “modified assessment tree for the enhanced bivalve fisheries” Annex SB or the “modified assessment tree for the enhanced salmon fisheries” Annex SC of MSC Fishery Standard v. 2.01 as follows:

P1	1.1.1 – 1.2.4	Principle 1 should be scored for the UoA as the fishery is a “Hatch and Catch” (HAC) fishery involving “translocation” of juvenile abalone from the hatchery to the grow out site. This is following the guidance for bivalve fisheries which have “translocation” (GSB2.1.2).
	1.1.3 Genetic Outcome	This PI has been taken from the “modified assessment tree for enhanced bivalve fisheries” Annex SB (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving translocations so this PI should be scored (GSB2.1.2).
	1.2.5 Genetic Management	This PI has been taken from the “modified assessment tree for enhanced bivalve fisheries” Annex SB (MSC Fisheries Standard v2.01) and is proposed for this fishery. This is an enhanced HAC fishery involving translocations so this PI should be scored (GSB2.1.2).

	1.2.6 Genetic Information	This PI has been taken from the "modified assessment tree for enhanced bivalve fisheries" Annex SB (MSC Fisheries Standard v2.01) and is proposed for this fishery. This is an enhanced HAC fishery involving translocations so this PI should be scored (GSB2.1.2).
P2	Primary (2.1.1-2.1-3) and secondary (2.2.1-2.2.3) ETP (2.3.1-2.3.3)	Principle 2 shall be scored for the UoA for all Ps following default tree and the following PIs modified
	2.4.1	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01) and following SC3.13.2 .
	2.4.2	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01). We will consider if strategies are in place for the enhancement activities that reduce impacts on water quality, access to settlement grounds, sedimentation etc to make it more applicable to this fishery.
	2.4.3	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01) and following SC3.15.2 to consider if information that is legally required to be collected by the permits (license) relevant to the habitat is being collected.
	2.5.1	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01) and following SC3.16.2 related to disease transmission and predation/competition.
	2.5.2	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01) and following SC3.17.1 related to management of disease and predation/competition.
	2.5.3	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery involving "habitat enhancement" as described in table SC8 (MSC Fisheries Standard v2.01) and following SC3.18.1 related to information collected to understand the impact of the enhancement activities on the receiving ecosystem.
P3	3.1.1-3.1.2	Principle 3 shall be scored for the UoA for all Ps following default tree and the following PIs modified
	3.1.3	This PI has been taken from the "modified assessment tree for enhanced salmon fisheries" Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery and special focus should be given to the enhancement activity when it comes to long-term objectives following SC 4.5.1 to consider

		whether the fishery’s enhancement activities have explicit long-term objectives and a guiding policy context that is consistent with managing for sustainable Principle 1 and Principle 2 outcomes for “wild abalone”, and that shapes short-term objectives and decision-making processes.
3.2.1		This PI has been taken from the “modified assessment tree for enhanced salmon fisheries” Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery and special focus should be given to SC 4.7.1 and whether clear objectives exist for the fishery’s enhancement activities that are consistent with achieving specific, related outcomes in Principles 1 and 2 .
3.2.2		This PI has been taken from the “modified assessment tree for enhanced salmon fisheries” Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery and special focus should be given to SC 4.8.1 whether the decision making processes surrounding enhancement activities, including determination of production levels and strategies, result in measures and strategies that are consistent with meeting specific objectives for ensuring Principles 1 and 2 outcomes.
3.2.3		This PI has been taken from the “modified assessment tree for enhanced salmon fisheries” Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery and special focus should be given to SC 4.9.1 whether private hatchery operators cooperate with management authorities in collection and sharing of information important to ensure that the production activities are complying with legal and management system objectives and requirements.
3.2.4		This PI has been taken from the “modified assessment tree for enhanced salmon fisheries” Annex SC (MSC Fisheries Standard v2.01). This is an enhanced HAC fishery and special focus should be given to SC 4.10.1 to evaluate whether hatchery operational plans include well-designed and supported provisions for monitoring the fishery’s enhancement activities that are consistent with achieving specific, related outcomes and objectives in Principles 1 and 2, with particular attention to evaluating the impacts of enhancement activities on natural production components and ecosystem function.

### 9.3 Peer Review reports

#### Peer reviewer A – General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage).	CAB Response to Peer Reviewer's comments
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	No	In the main the scoring is consistent with the MSC standard, and clearly based on the evidence presented in the assessment report, but there are several Pis where this may not be the case based on the information presented, and one where I believe it clearly isn't. This slightly unusual, enhanced fishery is in some ways awkward to assess against the MSC standards and I don't anticipate that the considerable number of comments in this review will ultimately make a very large difference to the overall result but nevertheless they need attention. The fishery is modest in scale and seems relatively benign in its impacts yet receives an unusually large number of conditions.	Thank you, your comments have been addressed and helped to improve to overall readability and evidence base of the report.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.2, 7.18.1 and sub-clauses]	Yes	There are ten conditions; A suggested addition to condition 2 has been made. The other nine conditions are appropriate to the scoring as presently drafted, but some may need re-evaluating in response to possible scoring changes suggested in this peer review.	The suggested change to condition 2 is discussed in the P1 comment related to that. The response to the other P1 comments demonstrates that scoring changes are not required. The issues raised have been addressed through providing better background information and improving scoring rationales to draw on additional evidence. Hence no condition changes are required.
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	Yes	Yes the report covers potential habitat modification due to the placement of the concrete abitats, as well as the mandatory evaluation of potential for genetic effects on wild populations. Potential indirect impacts on local wild abalone due to competition for food are also covered.	no response required

<p>Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.</p>	<p>NA</p>	<p>Additional information is required both in terms of management areas, sub-areas, bioregion management areas, and zones as it is difficult to understand where these all are, and how they relate to each other, to the UoA and to the culture lease site. A definitive map would help a lot. This would also help in understanding the definition of the stock (UoA) which is queried in the PI comments tab.</p> <p>For example there are references in Figures 2 and 3 to management area 2 and management area 3 (with the latter apparently containing the lease area) but nowhere could I find any information on the relevance of these "management areas" – what is the difference? How many are there? What is the relevance of MA2 if the lease is entirely within MA3? What is their relationship to the "West Coast Bioregion management area mentioned" in 7.4.1 – how many sub-areas? Presumably there is at least also a management area 1 – if management area 2 is relevant (even though it is outside of the lease areas) why not also management area 1? And where are the management areas in relation to the maps presented in figures 5, 6 and 7? It is difficult to fully understand the relevance of the lease area and enhancement activities, and of the sCPUE monitoring, without this information. Where is the Augusta sub-area (where the broodstock was taken from) in relation to the lease area?</p> <p>There is also a reference in the section on commercial fishery page 22 to a voluntary TACC being set in "Zone 1". Are zones and management areas the same thing? Where is Zone 1?</p>	<p>The lack of a map was an oversight. This has been addressed and should alleviate substantial confusion. Management areas have been set up to cover all three species of abalone. The greenlip abalone fishery is focussed almost exclusively on areas 2 and 3. The only other area with commercial fishing is area 4 with a negligible catch. The zones preceded areas and are only mentioned in the historic context material.</p> <p>A map clarifying the spatial distribution of the fishery and the management areas has been added to the P1 background. Also added is a map showing the location of the genetically distinct populations identified by Sandoval-Castillo et al. 2016. These additions should substantially clarify a number of issues identified across multiple PIs by this reviewer.</p>
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	<p>More information on habitats within the lease area would be very useful - On Page 49 of the report (section on VMEs) and again on the following page, it is stated "However, darker versus lighter blue areas in photograph need to be further explain in interviews at the site visit." Certainly, from Figure 6 it seems like there is considerably more reef (unclear how much macroalgae there is on the reef) than is acknowledged in figure 5 (thus concurring with the above statement); unless some of the darker areas are seagrass? It is not clear where the lease area is in relation to Figure 7.</p> <p>What are the abitats preferentially located on? It is apparently sand and sparse seagrass according to the report but from Figure 6 it appears possible the abitats placement may tend to avoid the paler (presumably sandy) areas in favour of darker, possible seagrass (or reef?) areas. It would be useful to know more.</p> <p>The example photograph in figure 1 does not look like sand with some sparse vegetation; but is not easy to interpret fully. There is very dense vegetation which may well be seagrass and/or natural seaweed on rock? Or drift seaweed (the report mentions drift algal wrack as being the main source of food for the abalones). Or alternatively is it densely packed abitats with dense seaweed growth? This needs much more explanation and consideration in the assessment.</p> <p>How widespread are the abitats around the green dots shown in Figure 6? There appear to be around 120 green dots representing moorings associated with groups of abitats (v rough estimate, I have not counted them thoroughly). Given that there are 9,652 abitats this is an average of around 80 per green dot – thus it is not easy to envisage the true coverage / distribution of the abitats relative to natural habitats.</p> <p>I appreciate these may be relatively minor points as calculations have estimated the seabed coverage at less than 1% overall but I still believe a better description is needed to jstify some of the PIs. These and other reated points are elaborated on in the relevant PI comments.</p>	<p>These have been updated and additional photographs and evidence provided. See detailed response to comments under PI 2.4.1</p>
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		<p>I am not really sure of the purpose of the statements in the box labelled "information gap indicator" following each PI in the scoring table. In general CABs seem to leave this as it was in the announcement comment draft report (ACDR), but in this report the introductory words "Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage" have mostly been removed and the contents have sometimes changed since the ACDR. Are these meant to represent further improvements to information that the Cab is now recommending / flagging up? Or were there changes to the ACDR subsequent to its having been published? Some clarification would be useful.</p>	<p>MSC encourages CAB to leave the details under "information gap" as they were highlighted in the ACDR and the focus of follow up information during the site visit. The rationales have been updated since but primarily with information related to these information gaps. these are not additional improvements flagged since the ACDR. It is more a formatting issue that the scoring range and other text does not appear in some places. They are all now visible for all PIs.</p>
		<p>Minor - Insert correct cross-references to figures 2&amp;3 near bottom of page 22.</p>	<p>These have been updated.</p>
		<p>Minor - wrt to the calculation for generation time in PI 1.1.2 (Si a) and elsewhere I presume this should refer to A<sub>50</sub> (age at 50% maturity in years) not L<sub>50</sub>.</p>	<p>This has been updated.</p>
		<p>Very minor edits required in places e.g.,  2.1.2(a) rationale "The SG 100 is not met as the minor primary do not have a sufficient strategy to manage the UoA impact." inset the word "species" after primary  "spares seagrass" should read "sparse seagrass" in several places</p>	<p>This has been corrected.</p>

UoA stock	UoA gear	PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments	CAB Response Code
South Coast of Western Australia Greenlip Abalone	Hand collection	1.1.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	The rationale for selection of abalones of the whole of western Australia in the definition of the stock is not clearly made at all. The report states that "it is estimated that populations generally encompass reef areas of around 30 km <sup>2</sup> , which are largely maintained through self-recruitment, and that distances of up to 130 km are effective barriers to larval dispersal (Mayfield et al. 2014)." It is also stated that the Virginia sub-area (i don't know where this is; no map provided but I understand this is a relatively small area) has been closed to fishing in 2019 to allow the abalone to recover; and as far as I can tell from statements elsewhere e.g. in scoring rationale for PI 1.1.3 all of the broodstock for this fishery has been taken from the Augusta sub-area. In combination this sounds like reasonable justification for considering the Augusta population as the greenlip abalone stock to be assessed with respect to this fishery. If this were agreed then the	<p>The Sandoval-Castillo et al. 2016 description provides a newer genetic perspective. This has been emphasised and combined with oceanographic dispersal information to provide a better rationale.</p> <p>A Virginia sub-area is not mentioned in the document; I assume you mean Augusta. From a larval dispersal perspective the Augusta population is upstream of the rest of the stock. The genetic analysis indicates the stock is well connected but locally adapted lines have much higher survival (hence creating the distinct populations detected through analysis of active loci). As such Sandoval-Castillo et al. 2016 conclude that the WA stock is a highly connected metapopulation with high connectivity promoted by the Leeuwin current.</p>	Accepted (no score change, change to rationale)

						entire P1 section would need to be rescored.	Consequently, the stock structure would fall under C in Table G2 in FCP v2.2. This rationale has been clarified in the document	
South Coast of Western Australia Greenlip Abalone	Hand collection	1.1.1	No (scoring implications unknown)	No (scoring implications unknown)	Yes	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI1.1.1 for my concerns in this regard).</p> <p>The arguments presented seem reasonable on the basis of the information presented, although I think more information is needed on the broodstock removals, the standardised Catch Per Unit Effort (sCPUE) and management areas to give confidence in the score.</p>	<p>The shortcomings and concerns regarding sCPUE were discussed in PI's 1.2.3.a, 1.2.3.b, 1.2.4.a and 1.2.4.c. This has been expanded and repeated in PI 1.1.1.</p> <p>The impact of broodstock removals is likely negligible and a rationale provided in PI 1.1.1</p>	Accepted (no score change, additional evidence presented)

<p>South Coast of Western Australia Greenlip Abalone</p>	<p>Hand collection</p>	<p>1.1.1</p>	<p>No (scoring implications unknown)</p>	<p>No (scoring implications unknown)</p>	<p>Yes</p>	<p>It seems highly likely the broodstock removals (which appear to be sporadic, especially since as I understand it recent enhancement activities seem to have been from broodstock bred in the hatchery) represent a trivially small proportion of the overall stock, but this should be demonstrated rather than assumed. There must surely be some sort of estimate of rough estimate of wider biomass of the stock (or failing that, annual removals) and hatchery removals. There is mention in P2 PIs and elsewhere of limitations on broodstock removals being 300 animals (per year?; what biomass would this equate to? would this removal concentrate on larger, more fecund individual?). presumably this relates only to the August sub-region so even if the CAB presents strong justification that the wider WA populations can be considered a single stock the impact on this local population should at least be discussed) Regarding the sCPUE there is no information provided on how it is carried out, and in particular what factors are standardised. From previous assessments and literature</p>	<p>A map clarifying the spatial distribution of the fishery and the management areas has been added to the P1 background. Also added is a map showing the location of the genetically distinct populations identified by Sandoval-Castillo et al. 2016. These additions should substantially clarify a number of issues identified across multiple PIs by this reviewer. The key areas are area 2 and 3. The only other area with commercial fishing is area 4 with a negligible catch. The confusion is partly due to the area numbering covering the other WA abalone species; hence they are not relevant for Greenlip.  Overall, the additional information makes for a better</p>	
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					<p>cited including Hart et al 2009 I can see that the sCPUE represents kg per diver per hour, and I understand that availability of internet weather forecasts, and in some instances (no everywhere) use of GPS. However, Hart et al also report many other factors that may need to be taken into account, including relative amounts of search and handling times. As far as I can tell no changes to the standardisation procedure has been undertaken since 2009 and it seems to me there is clear potential for efficiency of diver collection to change both with time (methods and technology; likely to increase kg/hr) but also with the great change in overall density of the abalones (likely to lower kg/hr). This is of course highly relevant to other PIs notably 1.2.4 but has ramifications here too as the sCPUE is the only measure of stock levels presented.</p> <p>Additionally more information is needed on the management areas/ zones and sub-areas. A reader can not know where these are in relation to the lease without at the very least a map showing these various units. Justification should be given as to why the sCPUE is</p>	<p>rationale that is more readable by an audience unfamiliar with this fishery but does not fundamentally alter the score.</p>
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						<p>used from management zones 2 and 3 only - is this where the broodstock are taken from, or where the lease area is, or both? Why is stock information from other management zones within Western Australia not included?</p> <p>I would be surprised if any of the above made a material difference to scoring but on present levels of presented information the scoring is difficult to justify.</p> <p>As it stands condition 1 seems appropriate.</p>		
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South Coast of Western Australia Greenlip Abalone	Hand collection	1.1.2	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	NA	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI1.1.1 for my concerns in this regard).</p> <p>For SI(b) it would help with confidence in agreeing that the approach meets the 80 guideline if there was more information on how the TACC will be set when the sCPUE is below the limit reference point, since the information in Figures 2 and 3 simply indicate that the TACC will be set at anywhere between 0 and 50% of the Sustainable Harvest Level (SHL); it is easy to envisage commercial pressure to apply closer to 50% . Clearly in Augusta sub-area there has been a complete closure for at least one year in 2019 (i.e. 0% SHL) and so this does give some confidence that the HCRs can be expected to be rigorously applied at least in some cases. There is considerable overlap here with PI 1.2.2 harvest control rules but the ambiguity clearly has implications for the outcome.</p>	<p>It is correct that the rebuilding strategy is not explicit about this. However past experience with catch reductions (e.g. the closure of the Augusta sub-area) shows that this has been implemented correctly and with appropriate tools. We consider this sufficient evidence that this aspect of the rebuilding strategy is likely to work as required by SG80. The rationale now includes this element.</p>	Accepted (no score change, change to rationale)
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South Coast of Western Australia Greenlip Abalone	Hand collection	1.1.3	No (scoring implications unknown)	No (scoring implications unknown)	NA	<p>This PI requires that "The fishery has negligible discernible impact on the genetic structure of the <b>population</b>". The assessment here seems to refer to the genetic structure of the <b>stock</b>, though due to the ambiguous use of some of the terms this is not completely clear; for example the rationale states "the broodstock lines are taken from natural reef in the Augusta area where the farm is located (OGA 2018) and the biomass level is thought to be low compared to the broader region" but the reader can not know what is meant here by "the broader region". Here and throughout the report there is insufficient definition of regions/management areas/ sub areas and zones with regards to the greenlip abalone fishery. Additionally the fishery does not seem to be releasing F1 progeny but a potentially more selected broodstock, this having only been identified more recently than the Webster et al 2017 risk assessment). Overall it is not clear on the basis of information presented, that the activity meets the 80 guideline for this PI.</p>	<p>The ambiguous "broader region" has been replaced with reference to the genetically distinct population identified in Sandoval-Castillo et al. 2016. This resolves concern about the SG60 rationale.</p> <p>The concern about the use of F1 progeny has been clearly discussed throughout the document. We have included additional information about the size of capture and the context of the genetically distinct population to support both SG60 and SG80 rationales.</p>	Accepted (no score change, change to rationale)
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South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.1	Yes	Yes	NA	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI1.1.1 for my concerns in this regard).</p> <p>I agree with the scoring and rationale.</p>	No change necessary.	NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.2	No (material score reduction expected to <80)	No (material score reduction expected to <80)	NA	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI1.1.1 for my concerns in this regard).</p> <p>Concerns regarding the standardisation of sCPUE as noted against PI 1.2.4 are relevant to SI 1.2.3(b). Given the concerns highlighted as long ago as 2009 (Hart et al 2009) the information presented may not meet the 80 guideline for 1.2.2(b).</p>	<p>The main uncertainties in the sCPUE index are corrected for through the standardisation process, thus meeting the requirement for SG80. This has been clarified in the rationale for SI 1.2.2(b). Details about other lines of evidence are provided in SI 1.2.2(a) and SI 1.2.2(b)</p> <p>The concerns highlighted by the reviewer are presented as one of the concerns and rationale for why SG100 is not met.</p>	Not accepted (no change)

South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.3	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	NA	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI 1.1.1 for my concerns in this regard).</p> <p>Concerns regarding the standardisation of sCPUE as noted against PI 1.2.4 are relevant to SI 1.2.2(b) and should be mentioned, but I do not see that this affects the scoring.</p> <p>Re Si c I am unclear whether the illegal catch is 3 tons or negligible; please clarify.</p>	<p>The concerns listed by the reviewer against 1.2.4(b) are already clearly discussed in 1.2.3(b) for the rationale as to why SG100 is not met. It is unclear what additional concerns should be discussed here.</p> <p>The illegal catch was discussed at two spatial scales -- the WAEGAF lease and all of WA. This has been clarified further in 1.2.3(c).</p>	Accepted (no score change, change to rationale)
South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.4	No (non-material score reduction expected)	No (non-material score reduction expected)	NA	<p>The following comments assume that it is reasonable to have scored this fishery against a stock defined in terms of the wider SE Australia populations rather than the local population (see comment above against PI1.1.1 for my concerns in this regard).</p> <p>With regard to SI1.2.4(a), as mentioned above, the standardisation process for the sCPUE is not described. There is no information provided on how it is carried out, and in particular what factors are standardised. From previous</p>	<p>The standardisation process has now been described in the P1 background section. Including the factors that are standardised.</p> <p>The rationale has been expanded to include the role of the model-based assessments which are not directly used on an annual basis for assessing stock status but demonstrate the</p>	Accepted (no score change, change to rationale)

						<p>assessments and literature cited including Hart et al 2009 I can see that the sCPUE represents kg per diver per hour, and I understand that availability of internet weather forecasts, and in some instances (not everywhere) use of GPS. However, Hart et al also report many other factors that may need to be taken into account, including relative amounts of search and handling times. As far as I can tell no changes to the standardisation procedure has been undertaken since 2009 and it seems to me there is clear potential for efficiency of diver collection to change both with time (methods and technology; likely to increase kg/hr) but also with the great change in overall density of the abalones (likely to lower kg/hr when abalones are less abundant). Unless further information is presented I am not convinced that the process meets the 100 guideline.</p>	<p>appropriateness of sCPUE and the reference levels that have been derived (against which sCPUE is evaluated in PI 1.1.1). This includes the use of a weight of evidence-based approach, fisheries dependent and independent length frequency data and assessment models.</p> <p>On the basis of this improved rationale for PI 1.2.4(a) we maintain that the scoring should not change.</p>	
South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.5	Yes	No (non-material score reduction expected)	No	<p>It seems clear that the partial strategy is not being implemented, and the scoring rationale pretty much states this; "It is unclear what the overall strategy entails as it appears to have deviated from what was described in Hart et. al. 2017 and Dof 2013." This</p>	<p>We agree that the rationale for 1.2.5(a) made it unclear what the partial strategy constitutes. The rationale has been revised to make it clear that those</p>	Accepted (no score change, change to rationale)

					<p>does not at all meet the 80 guideline for 1.2.5(c). The rationale seems to be taking the approach that as long as some part(s) of the partial strategy is/are being implemented it can be stated that there is "some evidence..." and 80 can be scored. This confuses "the amount of evidence" with "the amount of the strategy that is being implemented."</p> <p>The condition 2 already in place for 1.2.5 should have a requirement that the full strategy including use of F1 broodstock should be implemented - probably the timeframe already in place for the condition as already written will suffice.</p> <p>Please note that the condition is not referenced at the end of the scoring rationale (presently says N/A in the box titled "Condition number (if relevant)").</p>	<p>aspects that are "in place" as required by 1.2.5(a) are sufficient to constitute a partial strategy. The rationale has been adjusted accordingly.</p> <p>Consequently for 1.2.5(c) there is clear evidence that the partial strategy that is "in place" is being "implemented successfully" as required by 1.2.5(c).</p> <p>The condition number has been referenced at the end of 1.2.5.</p> <p>Whilst use of F1 broodstock may be a strategy for meeting 1.2.5(b) we do not want to be prescriptive about this as the client may develop an alternative strategy that meets 1.2.5(b).</p>
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South Coast of Western Australia Greenlip Abalone	Hand collection	1.2.6	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.1.1	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.1.2	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.1.3	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.2.1	Yes	Yes	NA	I agree with the scoring and rationale. Although the data is not clearly presented, total greenweight harvest of around 66-80 tons of abalone per year in the enhancement activity (section 7.2.3) mean that the likely catch of c 100-500 octopus or rock lobster per year (rationale for PI 2.2.2(a)) would not reach "main" levels even if they were considered as less resilient species.	The peer review comment belongs to PI 2.1.1 as both octopus and rock lobster are primary species. Octopus and rock lobster are both not "less resilient" species, additional explanation has been presented under the correct PI	Accepted (no score change, change to rationale)

							(2.1.1) in the report to justify the classification as "minor" species.	
South Coast of Western Australia Greenlip Abalone	Hand collection	2.2.2	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.2.3	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.3.1	Yes	Yes	NA	It seems slightly harsh not to score SI 2.3.1c at 100 given that most of the abalone in the lease area are enhanced anyway i.e. additional to the natural population - surely there is a high degree of confidence that this very benign activity will not have indirect impacts on even the turtles even without a dedicated study? This makes no material difference to the assessment however. Otherwise I agree with the scoring and rationale.	We agree with the comment and the rational has been updated and the score increased.	Accepted (score increased)

South Coast of Western Australia Greenlip Abalone	Hand collection	2.3.2	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.3.3	Yes	Yes	NA	Similar to 2.3.1 - it seems slightly harsh not to score the information under Si 2.3.3(a) at 100 I agree with the scoring and rationale. This makes no material difference to the assessment however. Otherwise, I agree with the scoring and rationale.	The team determined that a score of 80 for the scoring issue 2.3.3(a) was adequate as the information provided to the ERA for example from this sector to allow for a higher score.	Not accepted (no change)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.4.1	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	NA	On the face of it the loss of 1% of the seabed below the footprint of the abitats is an extremely minor impact, especially as the footprint may be overstated (the abitats have an open base).	Further evidence, photographs, have been included in the report with additional description of the vegetation visible in both the background and the rational.	Accepted (no score change, change to rationale)

South Coast of Western Australia Greenlip Abalone	Hand collection	2.4.1	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	NA	<p>However, there are inconsistencies and uncertainties in the evidence presented as follows :</p> <p>It is stated in several places that the abitatats are placed mainly on the sandy areas, which show up as the light coloured areas on photographs; however, in the one aerial photograph supplied (Figure 4) it seems to me that there is no evidence that the abitatats are preferentially located on sandy areas; in fact it seems, if anything, the very palest areas are slightly avoided. Furthermore, it seems that each green dot shown on the figure represents around 80 abitatats on average (my very rough estimate) and it is not clear how widespread the abitat coverage is in reality. Thus, it is possible that the local coverage of the abitatats is considerably greater than 1% in certain localities.</p> <p>The text in the justification for 2.4.1(a) states that dark areas are seagrass beds, and also that the abitatats are the only hard substrate in the lease area, but the legend for Figure 6 on page states that the dark areas are reefs with macroalgae and shows</p>	<p>An additional close up of Figure 1 has been provided alongside the first one to show that mainly kelp (<i>Ecklonia</i> sp. and <i>Sargassum</i> spp.) "wrack" accumulate and represent the "vegetation" in the background and around the "ABITATS". In addition, DPIRD staff conduct annual biomass surveys and observe the placement of the "ABITATS". These surveys were mentioned earlier in the background and also under 2.4.3. Now the rationale has further explanations and outcomes from the interviews at the site visit. During the site visit DPITD staff confirmed placement of "ABITATS" on sand only. This has been added as additional confirmation that placement is also monitored and</p>	Accepted (no score change, change to rationale)
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					<p>extensive dark areas within the lease areas. Even more confusingly on page 49 and again on page 50 of the report it is stated "However, darker versus lighter blue areas in photograph need to be further explain in interviews at the site visit." Figure 5 shows small areas described as reef overlapping the lease area at the southern edge.</p> <p>The photograph of the abitats in situ supplied in the report in Figure 1 does not show a sandy seabed but shows a great deal of dense vegetation, although this may well be from the largely drift seaweeds ("wrack") that are frequently mentioned in the report - which could, therefore, still be essentially a sandy habitat. However, based on this image alone the presence of reef with macroalgae or some seagrass cannot be ruled out. Clearly drift algae if widespread could further confuse the interpretation of light and dark areas in aerial photographs.</p> <p>The only references to habitat surveys are later in the rationale 2.4.3 but these appear to have concentrated on areas of natural habitat where juvenile abalone have</p>	<p>confirmed annually by DPIRD staff. Finally, the Melville-Smith et al. 2017 references has been cited to help support all of the above.</p>
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					<p>been historically released (i.e. reefs, which the report infers do not exist in the license area) in the wider Flinders bay area, and to have largely ignored seagrass, and so overall it is not clear upon what exactly - other than a single aerial photograph - the habitat information for the lease area is based.</p> <p>If the dark areas within the lease area turn out in full or in part to be seagrass beds then it seems likely that not all of them are "sparse". Moreover, given the likelihood that there are many seagrass species in this part of Australia, presumably some of which might have limited depth distribution, it can not be ruled that the habitats are not considerably affected.</p> <p>The above inconsistencies should be corrected, and as far as possible and further information provided, to give more confidence in the assessment. Nevertheless, the score may well be appropriate (including the 80 for SI 2.4.1(b) VME habitats outcome) because of the likely small scale of the impact and the fact that the MSC requires that the "When assessing the</p>		
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						<p>status of habitats and the impacts of fishing, the team shall consider the full area managed by the local, regional, national, or international governance body(s) responsible for fisheries management in the area(s) where the UoA operates (the "managed area" for short)." This assumes that the seagrass habitats in the lease area, that may or may not be impacted to some degree, are likely to be very widespread.</p>		
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<p>South Coast of Western Australia Greenlip Abalone</p>	<p>Hand collection</p>	<p>2.4.2</p>	<p>Yes</p>	<p>No (material score reduction expected to &lt;60)</p>	<p>Yes</p>	<p>Re SI 2.4.2(c) the wording of the rationale is confusing. It states that "The WAEGAF MEMP stipulates that the grow-out structures ("ABITATS") will not be placed directly on seagrass but will be deployed on clear sand patches (MEMP, 2020). This will need to be verified by the WAEGAF." Does this mean that the CAB is not presently sure whether WAEGAF actually does verify this?</p> <p>Clearly WAEGEF are the authority who should verify this but it is unclear if they actually have.</p> <p>Re SI 2.4.2(d) the rationale states that "Compliance with relevant management requirements to protect VMEs include photographs supplied by the WAEGAF showing light sandy patches throughout the lease area where the moorings for each groups of abalone grow-out structures ("ABITATS") are placed. The SG 60 is met."</p> <p>However as stated above in the comments against 2.4.1 the evidence from the photograph in Figure 4 clearly does not support this</p>	<p>The rationale has been updated to reflect the information collected at the site visit (extra photographs and interviews with DPIRD staff).</p>	<p>Accepted (no score change, additional evidence presented)</p>
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						<p>statement (and the distribution/number of abitats in relation to the green dots on the photographs is not described though this is likely of less importance). Are there other similar photographs that have been reviewed by WAGAF? The evidence for this SI needs to be reviewed.</p> <p>Condition 3 is sufficient to address the case where SI2.4.2(d) scores &lt;80 but if the score is assigned as &lt;60 then this becomes irrelevant as the fishery would fail.</p>		
South Coast of Western Australia Greenlip Abalone	Hand collection	2.4.3	No (scoring implications unknown)	No (scoring implications unknown)	Yes	<p>Again, the confusion over habitat information discussed in some detail above against PI 2.4.1 is relevant. Until the habitat distribution and associated information sources are better described, it is hard to support the scores for SI (a) and (b).</p> <p>If the presently assigned scores are then justified, then the condition 4 is appropriate. It would strengthen the condition if there was requirement to clearly state the intended survey frequency.</p>	As explained under 2.4.1 further photographs as well as information collected from interviews at the site visit has been added. During the site visit DPIRD staff confirmed placement of "ABITATS" on sand only. This has been added as additional confirmation that placement is also monitored and confirmed annually	Accepted (no score change, additional evidence presented)

							by DPIRD staff during annual abalone biomass surveys.	
South Coast of Western Australia Greenlip Abalone	Hand collection	2.5.1	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.5.2	Yes	Yes	Yes	I agree with the scoring and rationale. Condition 5 is appropriate.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.5.3	Yes	Yes	Yes	I agree with the scoring and rationale. Condition 6 is appropriate.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.6.1	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	2.6.2	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)

South Coast of Western Australia Greenlip Abalone	Hand collection	2.6.3	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	3.1.1	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of WA Greenlip Abalone	Hand collection	3.1.2	Yes	Yes	NA	I agree with the scoring and rationale.		NA (No response needed)
South Coast of Western Australia Greenlip Abalone	Hand collection	3.1.3	Yes	Yes	NA	I agree with the scoring and rationale. As a very minor point, the use of the term "fisheries specific initiatives and targets:" in the 12th paragraph is slightly confusing given the MSCs use of the term "fishery specific objectives" in the following PI (3.2.1)	Noted and corrected	Accepted (no score change, change to rationale)
South Coast of WA Greenlip Abalone	Hand collection	3.2.1	Yes	Yes	Yes	There are short term objectives for the wild fishery as acknowledged in the rationale. It is not clear what sort of short-term objectives would be appropriate to the enhancement activities that are not already covered by the long term objectives, for which reason the score seems a little harsh.	Short term objectives for the enhanced fishery specifically could be developed such as habitat mapping to be conducted before the "ABITAT" footprint or lease area is expanded.	Not accepted (no change)

						Condition 7 is appropriate assuming the scoring is not increased.		
South Coast of WA Greenlip Abalone	Hand collection	3.2.2	Yes	Yes	Yes	I agree with the scoring and rationale. Condition 8 is appropriate.		NA (No response needed)
South Coast of WA Greenlip Abalone	Hand collection	3.2.3	Yes	Yes	Yes	I agree with the scoring and rationale. Condition 9 is appropriate.		NA (No response needed)
South Coast of WA Greenlip Abalone	Hand collection	3.2.4	Yes	Yes	Yes	I agree with the scoring and rationale. Condition 10 is appropriate.		NA (No response needed)

## Peer reviewer B – General Comments

Question	Yes/ No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	There has been a number of previous assessments done for the wider wild abalone fishery and information from these assessments have been used to inform the CPDR. The CPDR also benefits from the information provided with the MSC Certification of the wild abalone fishery, much of which, is used in the CPDR. The assessment scoring is considered suitable and the information provided was detailed for assessment purposes.	No response required.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes	The conditions set are considered achievable in the time frames allocated noting the exceptional circumstances for condition 1.	No response required.
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	Yes	The assessment has highlighted deficiencies in data and compliance and set conditions and recommendations to rectify these gaps. A further recommendation could be made similar to Recommendation 2 for research to be conducted to assess the amount of commensal organisms removed during harvesting of abalone to determine if the volume of commensal organisms removed are indeed greater or smaller than 5 % of the UoA catch.	No response required. However, this has been included for the 2.2.2 (management) which would not have influenced the score overall. The recommendation even though interesting in terms of overall research would not influence the score for 2.2.1 either. Therefore, the focus of research efforts are directed to other ecosystem components under 2.5.1 and the respective condition.

Optional: General Comments on the Peer Review Draft Report	NA	Overall, this fishery is relatively well-managed though it is noted that there are some issues with regulatory oversight and reporting requirements. The enhanced abalone fishery itself has the benefit of being well defined and in a specific location though requiring more suitable and ongoing data collection. Additional information on biological and ecological parameters for sea ranched abalone can be found in Munday (2020) [ <a href="https://researchrepository.murdoch.edu.au/id/eprint/59343/1/Mundy2020.pdf">https://researchrepository.murdoch.edu.au/id/eprint/59343/1/Mundy2020.pdf</a> ].	The reference has been considered.
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UoA stock	UoA gear	PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
Greenlip abalone	Hand collecting	1.1.1	Yes	Yes	Yes	Scoring agreed. Condition 1 is agreed noting its exceptional circumstance regarding stock rebuilding timeframes.		NA (No response needed)
Greenlip abalone	Hand collecting	1.1.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	1.1.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	1.2.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	1.2.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	1.2.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	1.2.4	Yes	Yes	NA	Scoring Agreed		NA (No response needed)

Greenlip abalone	Hand collecting	1.2.5	Yes	No (scoring implications unknown )	Yes	<p>Scoring Agreed. In the CPRDR, the number '2' needs to be added to the Conditions section. Currently, it says 'NA' though is listed in the Conditions Section 5.2.3. In the CPRDR's Executive Summary, it notes that the stock described in the UoA is the same as the greenlip abalone stock assessed under the MSC Certification of the wild abalone fishery and as such relevant components of the assessment have been harmonised. Is it possible to produce a table/summary for this PI of where the MSC Certification and the CPRDR have been harmonised given that certain statements were made in the MSC Certification of the wild abalone fishery which resulted in this PI being scored higher suggesting a re-interpretation of results from Sandoval-Castillo et al. (2016) and additional concerns in the CPRDR over genetics, spawning potential and larval dispersal? It would appear that in the</p>	<p>The condition number has been added.</p> <p>The harmonisation is with the 2022 re-assessment of the Western Australia abalone fishery. This has now been described in the introduction.</p>	Accepted (no score change, change to rationale)
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						CPRDR, a greater precautionary approach to genetic impacts is being applied. Condition 2 and Recommendation 1 are agreed.		
Greenlip abalone	Hand collecting	1.2.6	Yes	No (scoring implications unknown)	NA	Scoring Agreed. Similarly, to PI 1.2.5 above, in the MSC Certification of the wild abalone fishery, this PI was scored higher. Is it possible to produce a table/summary of where the MSC Certification and the CPRDR have been harmonised for this PI given that certain statements in the MSC Certification of the wild abalone fishery and the CPRDR suggest a re-interpretation of results from Sandoval-Castillo et al. (2016) and additional concerns raised in the CPRDR over genetics, spawning potential and larval dispersal? It would appear that in the CPRDR, a greater precautionary approach to genetic impacts is being applied.	The harmonisation is with the 2022 re-assessment of the Western Australia abalone fishery. This has now been described in the introduction.	Accepted (no score change, change to rationale)
Greenlip abalone	Hand collecting	2.1.1	Yes	Yes	NA	Scoring Agreed. (Noting one shark caught in the		NA (No response needed)

						entire time of operations).		
Greenlip abalone	Hand collecting	2.1.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	2.1.3	Yes	Yes	NA	Scoring Agreed. Recommendation 2 is also agreed.		NA (No response needed)
Greenlip abalone	Hand collecting	2.2.1	Yes	Yes	NA	Scoring Agreed. Of interest, in the MSC Certification of the wild abalone fishery that this PI was scored higher with reference to commensal organisms (e.g., coralline algae, sponges and small invertebrates). As has been noted in the CPRDR, there has been no formal quantification of commensal organisms, though impacts are regarded as minor or negligible. Is it considered worthwhile for further research to be conducted to actually assess the amount of commensal organisms removed during harvesting of abalone to determine if the volume of commensal organisms removed are indeed greater or smaller than 5 % of the UoA catch?	Since the original Western Australian abalone assessment in 2016, the fishery has now entered re-assessment and the ACDR is posted, and the report updated to the client and peer review draft report. The ACDR for the re-assessment has a harmonised score for 2.2.1 following the cited MSC interpretation ( <a href="https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233">https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233</a> ). The team decided for this re-assessment not to use the RBF given the low quantity of the encrusting biota (as supported by clause	NA (No response needed)

							PF4.1.4) and the PI score is capped at SG 80 following PF5.3.2. Consequently, SG100 is not met.	
Greenlip abalone	Hand collecting	2.2.2	Yes	Yes	NA	Scoring Agreed. Given the statements made in PI 2.2.1 on the uncertainty of impacts of removing commensal organisms, if further research did determine that commensal organisms removed during harvesting were indeed greater than 5 % of the UoA catch, than management strategies would need to be developed.	see above. In addition, the harvest strategy for the wider abalone fishery, provides a strategy for all bycatch species including commensal species and therefore it is met for these species, regardless of if they are minor or major species.	NA (No response needed)
Greenlip abalone	Hand collecting	2.2.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	2.3.1	Yes	Yes	NA	Scoring Agreed. Has there been any formal assessment of loggerhead turtle populations in Flinders Bay/UoA/Area 3 and levels of predation on abalone stocks?	Records on ETP interactions are kept by the company and reported if they occur. No formal assessments of loggerhead turtle population or level of predation exist in Flinders Bay.	NA (No response needed)
Greenlip abalone	Hand collecting	2.3.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)

Greenlip abalone	Hand collecting	2.3.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	2.4.1	Yes	No (scoring implications unknown)	NA	Scoring Agreed. Of interest, in the MSC Certification of the wild abalone fishery that this PI was scored higher as it was determined that there were no VMAs in the UoAs/Areas where abalone was harvested and it would appear that in the CPRDR, a greater precautionary approach to impacts on VMEs in the UoA where the enhanced abalone fishery is operating. Could a table/summary be provided on where harmonisation of the MSC Certification and the CPRDR for this PI?	Since the original assessment of the Western Australian Abalone assessment (wild fishery) in 2016 further guidance has been provided as to VME designation and including potential VMEs. The re-assessment of the wild fishery has started and the ACDR also include seagrass as VMEs. Therefore, this has now been harmonised.	Not accepted (no change)
Greenlip abalone	Hand collecting	2.4.2	Yes	Yes	Yes	Scoring Agreed. Condition 3 is also agreed. Is it possible to have the ABITATs geo-tagged so they can be mapped against the area of the lease and the UoA?	The "ABITAT" locations are set with GPS markers and carry a unique code. All harvested abalone can be traced back to individual "ABITATs" / "ABITAT" lines.	NA (No response needed)
Greenlip abalone	Hand collecting	2.4.3	Yes	Yes	Yes	Scoring Agreed. Condition 4 is also agreed.		NA (No response needed)
Greenlip abalone	Hand collecting	2.5.1	Yes	Yes	Yes	Scoring Agreed		NA (No response needed)

Greenlip abalone	Hand collecting	2.5.2	Yes	Yes	Yes	Scoring Agreed. Condition 5 is agreed, but could be reworded for better understanding in Section 5.3.2.	following FCP v 2.2 7.18.1.2., the wording of the condition needs to reflect the exact wording of the scoring guidepost and cannot be reworded.	Not accepted (no change)
Greenlip abalone	Hand collecting	2.5.3	Yes	Yes	Yes	Scoring Agreed. Condition 6 is agreed (and c/would be linked to actions under PI 2.4.3).		NA (No response needed)
Greenlip abalone	Hand collecting	2.6.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	2.6.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	2.6.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	3.1.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	3.1.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	3.1.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Greenlip abalone	Hand collecting	3.2.1	Yes	Yes	Yes	Scoring Agreed. Of interest, in the MSC Certification of the wild abalone fishery that this PI was scored higher due the short-term objectives in the Abalone Harvest Strategy. In this		NA (No response needed)

						assessment however there are requirements of the Abalone Aquaculture Policy to be remediated to detail short-term objectives. Condition 7 is therefore agreed.		
Greenlip abalone	Hand collecting	3.2.2	Yes	Yes	Yes	Scoring Agreed. Condition 8 is agreed.		NA (No response needed)
Greenlip abalone	Hand collecting	3.2.3	Yes	Yes	Yes	Scoring Agreed. Condition 9 is agreed.		NA (No response needed)
Greenlip abalone	Hand collecting	3.2.4	Yes	Yes	Yes	Scoring Agreed. Condition 10 is agreed (and c/would be linked to PI 3.2.1).		NA (No response needed)

## 9.4 Stakeholder input

No stakeholder comments were received at the Announcement Comment Draft Report stage or before or during the site visit.

## 9.5 Conditions

### 9.5.1 Conditions

Table 10 – Condition 1	
Performance Indicator	1.1.1 (Stock Status)
Score	60
Justification	<p>Full justification is provided on page 30. A brief summary of key points is provided here.</p> <p>Scoring issue a is not met at SG80 as it is not highly likely that the stock is above the PRI:</p> <p><i>"When compared to the new reference points the 2020 sCPUE is approximately equal to the limit reference point in Area 2 and just above it in Area 3."</i></p> <p><i>"A risk analysis utilising a range of modelling approaches found that Area 2 had a 5-20% chance of being below the limit reference point, whilst Area 3 had a 20-50% chance (DPIRD in prep)."</i></p> <p>Scoring issue b is not met at SG80 as:</p> <p><i>"the broader population is clearly below a level consistent with MSY. Target reference points corresponding to MSY have been established for both areas. The fishery has only occasionally exceeded these and due to the declines described in scoring issue a, and the P1 background, the stock is currently clearly well below these."</i></p> <p><b>Note</b> that exceptional circumstances apply as the generational time means that a rebuild may not be possible even under perfect implementation (FCP v2.2 7.18.1.6).</p>
Condition	Ensure the stock is highly likely to be above the PRI and is at or fluctuating around a level consistent with MSY.
Condition deadline	<p><b>2035</b></p> <p>Note: the two times the generation time of greenlip abalone is approximately 16 years (i.e. 2 x 8 years, based on 1/M+A<sub>50</sub> maturity, where M is assumed to be 0.2 and A<sub>50</sub> maturity is 3 years). Therefore, we propose to extend the condition for 16 years, starting from 2019 when a condition for the same PI and species was re-written. The condition will then be harmonised with the condition of the Western Australian Abalone Fishery assessment.</p>
Exceptional circumstances <input checked="" type="checkbox"/>	Exceptional circumstances apply as the generational time means that a rebuild may not be possible even under perfect implementation (FCP v2.2 7.18.1.6).
Milestones	<p><b>Audit 1:</b></p> <p>a) Evaluate the stock status against the rebuild trajectory to determine if the stock remains on the trajectory and the rebuild deadline remains feasible. If the rebuild trajectory is not met any required changes should be made to the rebuild strategy and implemented by the subsequent audit.</p>

	<p>Resulting score: 60 Unchanged</p> <p><b>Audit 2:</b></p> <ul style="list-style-type: none"> <li>a) As per audit 1.</li> <li>b) Identify any information that could be obtained (e.g. surveys, monitoring or data analysis) that is likely to provide additional evidence to close this condition.</li> </ul> <p>Resulting score: 60 Unchanged</p> <p><b>Audit 3:</b></p> <ul style="list-style-type: none"> <li>a) As per audit 1.</li> <li>b) Obtain the information identified in audit 2.b</li> </ul> <p>Resulting score: 60 Unchanged</p> <p><b>Audit 4:</b></p> <ul style="list-style-type: none"> <li>a) Use the evidence collected in audit 3 to provide evidence of the stock status. Exceptional circumstances apply and it is not unlikely that the required rebuild will not have occurred at this time and the condition will be carried over into the following certification period. In this circumstance it is expected that the rebuild strategy will be substantially re-evaluated retaining the rebuild commencement date of the initial stock recovery plan.</li> </ul> <p>Resulting score: likely unchanged</p>
Verification with other entities	NA
<i>Complete the following rows for reassessments.</i>	
Carried over condition <input type="checkbox"/>	NA
Related condition <input type="checkbox"/>	NA
Condition rewritten <input type="checkbox"/>	NA

**Table 11 – Condition 2**

Performance Indicator	1.2.5 (Genetic Management)
Score	75
Justification	<p>Full justification on page 31.</p> <p>In summary, scoring issue b was not met at the SG80 level due to a lack of confidence that the partial strategy will work. This is due to:</p> <ul style="list-style-type: none"> <li>• A lack of information regarding the likelihood of larvae spawned from the ABITATS settling on nearby reefs.</li> <li>• A lack of comparisons of spawning biomass between the WAEGAF population and the broader Augusta population.</li> </ul>

	<ul style="list-style-type: none"> <li>The low Augusta population when compared to the increasing WAEGAF population increasing the potential for harm to the genetic diversity of the wild population.</li> </ul>
Condition	By the third annual audit provide an objective basis for confidence that the partial strategy will work through a combination of improved information and/or a modified strategy.
Condition deadline	Audit 3
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Audit 1:</b></p> <ul style="list-style-type: none"> <li>Determine what information needs to be collected (from the WAEGAF and Augusta populations) and present a plan for conducting this work.</li> <li>Consider whether any changes need to be made to the strategy to increase the probability that it will work and present a plan for how these changes will be implemented.</li> </ul> <p>Resulting score: 75 Unchanged</p> <p><b>Audit 2:</b></p> <ul style="list-style-type: none"> <li>Provide an update on work to collect the required information and implement any required changes to the strategy</li> </ul> <p>Resulting score: 75 Unchanged</p> <p><b>Audit 3:</b></p> <ul style="list-style-type: none"> <li>Present an analysis of the (potentially) revised strategy and use the collected information to demonstrate that the strategy will work.</li> </ul> <p>Resulting score: 80</p>
Verification with other entities	NA
<i>Complete the following rows for reassessments.</i>	
Carried over condition <input type="checkbox"/>	NA
Related condition <input type="checkbox"/>	NA
Condition rewritten <input type="checkbox"/>	NA

**Table 12 – Condition 3**

Performance Indicator	2.4.2
Score	75
Justification	Scoring issue d is not met at the SG80. Compliance with relevant management requirements to protect VMEs include photographs supplied by WAEGAF showing light sandy patches throughout the lease area where the moorings for each groups of abalone grow-out structures (“ABITATS”) are placed. The SG

	60 is met. There is no quantitative evidence that the MEMP, which is the partial strategy for WAEGAF, is being implemented successfully.
Condition	By the third annual surveillance audit provide quantitative evidence that the UoA and associated enhancement activities comply with both its management requirements and with protection measures afforded to VMEs (seagrass).
Condition deadline	<b>Year 3 (2025)</b>
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b></p> <p>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be collected and provided to the CAB.</p> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <p>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be collected and provided to the CAB.</p> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p> <p>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be analysed and provided to the CAB to show that all aspects of the MEMP that relate to protection of VMEs have been implemented.</p> <p>Resulting score: <b>80.</b></p>
Verification with other entities	DPIRD

**Table 13 – Condition 4**

Performance Indicator	2.4.3
Score	75
Justification	Scoring issue c is not met. Adequate information is not been collected to detect any increase in risk to the main habitats as changes to habitat distributions are not measured.
Condition	By the third surveillance audit provide evidence to the CAB that adequate information continues to be collected to detect any increase in risk to the main habitats.
Condition deadline	<b>Year 3 (2025)</b>

Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b></p> <p>Set up a habitat monitoring program that is ongoing and includes the main habitats and any potential VMEs (like seagrass) and provided to the CAB.</p> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <p>Collect information on the distribution of main habitats including VMEs (like seagrass) and provided to the CAB.</p> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p> <p>Collect information on the distribution of main habitats including VMEs (like seagrass) analyse and provided to the CAB to show that the program is ongoing.</p> <p>Resulting score: <b>80.</b></p>
Verification with other entities	DPIRD

**Table 14 – Condition 5**

Performance Indicator	2.5.2
Score	75
Justification	Scoring issue d is not met at the SG 80 level. The MEMP does not include the hatchery component and it has not been fully tested.
Condition	By the fourth surveillance audit provide evidence of a tested and evaluated artificial production strategy with sufficient monitoring in place of all aspects of the production, including hatchery, to reasonably ensure with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.
Condition deadline	<b>Year 4 (2026)</b>
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b></p> <p>Develop an artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery and provided to the CAB.</p> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p>

	<p>Finalise the development of an artificial production strategy and demonstrate that it has sufficient monitoring in place of all aspects of the production, including hatchery and provided to the CAB.</p> <p>Resulting score: <b>75</b>.</p> <p><b>Year 3</b> (2025)</p> <p>Provide the artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery and demonstrate that has been tested and evaluated and provided to the CAB.</p> <p>Resulting score: <b>75</b>.</p> <p><b>Year 4</b> (2026)</p> <p>Demonstrate that the artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery, that has been tested and evaluated will with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.</p>
Verification with other entities	DPIRD

**Table 15 – Condition 6**

Performance Indicator	2.5.3
Score	75
Justification	<p>Scoring issues d and e are not met at the SG 80 level.</p> <p>(d) Information relevant to the ecosystem like algal and seagrass biomass, species composition, competitors and predators have not been analysed. Therefore, the information currently available on the impact of the UoA and associated enhancement activities specifically is not considered adequate and</p> <p>(e) Adequate data does not continue to be collected to detect any increase in risk level.</p>
Condition	By the fourth annual surveillance audit provide information of the main impacts of the UoA and associated enhancement activities specifically that is considered adequate and continues to be collected to detect any increase in risk level.
Condition deadline	Year 4 (2026)
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1</b> (2023)</p> <p>Develop a monitoring program on relevant ecosystem components and provided to the CAB.</p>

	<p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <p>Finalise the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred or included additional component of necessary and provided to the CAB.</p> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p> <p>Demonstrate that the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred and provided to the CAB.</p> <p>Resulting score: <b>75.</b></p> <p><b>Year 4 (2026)</b></p> <p>Demonstrate that the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred continues to be collected.</p> <p>Resulting score: <b>80.</b></p>
Verification with other entities	DPIRD

**Table 16 – Condition 7**

Performance Indicator	3.2.1 – Fishery-specific objectives
Score	70
Justification	Management objectives exist in several management documents and some long term objectives are explicit within the management system, however there are no fishery-specific short term objectives
Condition	By the second surveillance audit, ensure that short term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2 are explicit (i.e. well defined and measurable) within the fishery and associated enhancement management system.
Condition deadline	Year 2 (2024)
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b></p> <p>Short- term objectives consistent with achieving Principles 1 and 2 outcomes have been drafted.</p> <p>Resulting score: <b>70.</b></p>

	<p><b>Year 2 (2024)</b> DPIRD and the client have finalised short -term objectives designed to achieve Principle 1 and 2 outcomes and these are explicit in the management system.</p> <p>Resulting score: <b>80</b>.</p>
Verification with other entities	DPIRD

**Table 17– Condition 8**

Performance Indicator	3.2.2 – Decision-making processes
Score	75
Justification	<p>Scoring issue (b) and (d) did not met SG 80. There is limited evidence of responsive decisions despite knowledge of unfulfilled MEMP requirements and broodstock exemptions that have been granted to remove stock from an area of a declined fishery that is now closed.</p> <p>Information on the fishery’s performance and management action is limited, specifically with regards to meeting the MEMP requirements and the use of broodstock to supply juveniles.</p>
Condition	By the third surveillance audit, ensure that decision making processes respond to important issues including annual MEMP reporting and take account of the wider implications of decisions such as the broodstock exemption. Information on the fishery performance and management action should be made available if requested.
Condition deadline	Year 3 (2025)
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b> DPIRD demonstrate that annual MEMP reporting is being complied with in order to make responsive decisions to any serious and important issues that are identified. Demonstrate that the impact of the broodstock exemption has been considered in line with the current status of the resource.</p> <p>Resulting score: <b>75</b></p> <p><b>Year 2 (2024)</b> DPIRD demonstrate that the issue of predator removal relating to P2 issues and compliance has been considered.</p> <p>Resulting score: <b>75</b></p> <p><b>Year 3 (2025)</b> DPIRD demonstrate that information on the fishery’s performance and management action (e.g. in line with MEMP requirements) is available on request including explanation of management actions or lack thereof.</p> <p>Resulting score: <b>85</b></p>

Verification with other entities	DPIRD
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**Table 18 – Condition 9**

Performance Indicator	3.2.3 – Compliance and enforcement
Score	70
Justification	Scoring issue (b) and (c) did not met SG 80. While a compliance and enforcement regime is in place, the absence of any sanctions applied, despite identified breaches in relation to MEMP requirements, indicate an inconsistency in the application of sanctions. Fishers are generally thought to comply with most of the management system for the fishery under assessment, including, when required, providing some (but not all) information, of importance to the effective management of the fishery.
Condition	By the second surveillance audit, provide evidence that sanctions are consistently applied and that fishers comply and provide required information of importance to effectively manage the fishery, including annual MEMP reports.
Condition deadline	Year 2 (2024)
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<b>Year 1 (2023)</b> Provide evidence that sanctions are consistently applied and that fishers provide required information such as MEMP reports.  Resulting score: <b>70</b>  <b>Year 2 (2024)</b> Provide evidence that the sanctions are thought to provide effective deterrence and that fishers comply with the management system (including all MEMP requirements).  Resulting score: <b>80</b>
Verification with other entities	DPIRD

**Table 19 – Condition 10**

Performance Indicator	3.2.4 – Monitoring and performance evaluation
Score	70
Justification	Scoring issue (a) did not met SG 80. There is no mechanism for monitoring and evaluating the performance of key parts of the fishery-specific management system which includes the hatchery and grow operation, in part because there are no short term objectives but also because there is no reporting or feedback to management (e.g. from the MEMP, exemption activities or compliance inspections) to enable an evaluation of fishery performance.

Condition	By the third surveillance audit, the fishery and associated enhancement programs must have in place a mechanism to evaluate key parts of the management system.
Condition deadline	Year 3 (2025)
Exceptional circumstances <input type="checkbox"/>	NA
Milestones	<p><b>Year 1 (2023)</b> DPIRD demonstrate that the compliance regime for this fishery (e.g. risk assessment process and operational compliance plan) has been evaluated.</p> <p>Resulting score: <b>70</b></p> <p><b>Year 2 (2024)</b> DPIRD demonstrate that the exemptions relevant to the enhanced fishery activities have been evaluated.</p> <p>Resulting score: <b>70</b></p> <p><b>Year 3 (2025)</b> DPIRD demonstrate that a mechanism is in place and an evaluation of the annual MEMP report against the fishery's long and short term objectives has been completed.</p> <p>Resulting score: <b>80</b></p>
Verification with other entities	DPIRD

## 9.1 Client Action Plan

**Table 20 - PI 1.1.1**

1	Condition number
	1
2	Performance Indicator(s)
	1.1.1 (Stock Status)
3	Score
	60
4	Condition(s)
	Ensure the stock is highly likely to be above the PRI and is at or fluctuating around a level consistent with MSY.
5	Milestone(s)
	<p><b>Audit 1:</b></p> <p>b) Evaluate the stock status against the rebuild trajectory to determine if the stock remains on the trajectory and the rebuild deadline remains feasible. If the rebuild trajectory is not met any required changes should be made to the rebuild strategy and implemented by the subsequent audit.</p> <p>Resulting score: <b>60 Unchanged</b></p> <p><b>Audit 2:</b></p> <p>c) As per audit 1.</p> <p>d) Identify any information that could be obtained (e.g., surveys, monitoring or data analysis) that is likely to provide additional evidence to close this condition.</p> <p>Resulting score: <b>60 Unchanged</b></p> <p><b>Audit 3:</b></p> <p>c) As per audit 1.</p> <p>d) Obtain the information identified in audit 2.b</p> <p>Resulting score: <b>60 Unchanged</b></p> <p><b>Audit 4:</b></p> <p>b) Use the evidence collected in audit 3 to provide evidence of the stock status. Exceptional circumstances apply and it is not unlikely that the required rebuild will not have occurred at this time and the condition will be carried over into the following certification period. In this circumstance it is expected that the rebuild strategy will be substantially re-evaluated retaining the rebuild commencement date of the initial stock recovery plan.</p> <p>Resulting score: <b>likely unchanged</b></p>
6	Summary of action plan

Undertake annual assessments that determine Greenlip abalone stock status relative to PRI and BMSY, that indicate whether the rebuilding trajectory is being met. Revise the Greenlip abalone Recovery Strategy should the rebuilding trajectory not be met and determine additional sources of information for input in the annual stock assessment.			
Milestone	Action	Roles & Responsibilities	Outputs
Audit 1	<p>Draft assessment that evaluates stock status for Greenlip abalone against current Recovery Strategy.</p> <p>If outcome of the draft assessment indicates rebuilding trajectory is not being met, then revise the Greenlip abalone Recovery Strategy to ensure the stock is likely to recover within appropriate rebuilding timeframes.</p>	DPIRD	<p>1. Draft assessment of stock status for Greenlip abalone</p> <p>2. Revise Greenlip abalone Recovery Strategy – if required</p>
Audit 2	<p>a) Draft assessment that evaluates stock status for Greenlip abalone against current Recovery Strategy.</p> <p>If outcome of the draft assessment indicates rebuilding trajectory is not being met, then revise the Greenlip abalone Recovery Strategy to ensure the stock is likely to recover within appropriate rebuilding timeframes.</p> <p>b) Review current assessment methodology (SCPUE, data sources, length-based models, etc.) and identify any potential additional information that would improve the Greenlip abalone stock assessment.</p>	DPIRD	<p>1. Draft assessment of stock status for Greenlip abalone</p> <p>2. Revise Greenlip abalone Recovery Strategy – if required</p> <p>3. Review of current assessment methodologies identifying potential additional sources of information.</p>
Audit 3	<p>a) Draft assessment that evaluates stock status for Greenlip abalone against current Recovery Strategy.</p>	DPIRD	<p>1. Draft assessment of stock status for Greenlip abalone</p>

	<p>If outcome of the draft assessment indicates rebuilding trajectory is not being met, then revise the Greenlip abalone Recovery Strategy to ensure the stock is likely to recover within appropriate rebuilding timeframes.</p> <p>b) Complete data collection of any potential additional sources of information that were identified during Audit 2.</p>		<p>2. Revise Greenlip abalone Recovery Strategy – if required</p> <p>3. Report potential additional data sources and define influence within the draft assessment.</p>
Audit 4	<p>Final assessment for Greenlip abalone that includes rationale for potential new information sources and provides appropriate simulation testing.</p> <p>Re-evaluate the Greenlip abalone Recovery Strategy based on the final assessment to ensure the stock is likely to recover within appropriate rebuilding timeframes.</p>	DPIRD	<p>1. Final assessment of stock status for Greenlip abalone</p> <p>2. Evaluation of performance against Greenlip abalone Recovery Strategy (revise if required)</p>

**Table 21 - PI 1.2.5**

1	Condition number								
	2								
2	Performance Indicator(s)								
	1.2.5 (Genetic Management)								
3	Score								
	75								
4	Condition(s)								
	By the third annual surveillance audit provide an objective basis for confidence that the partial strategy will work through a combination of improved information and/or a modified strategy.								
5	Milestone(s)								
	<p><b>Audit 1:</b></p> <ul style="list-style-type: none"> <li>Determine what information needs to be collected (from the WAEGAF and Augusta populations) and present a plan for conducting this work.</li> <li>Consider whether any changes need to be made to the strategy to increase the probability that it will work and present a plan for how these changes will be implemented.</li> </ul> <p>Resulting score: <b>75 Unchanged</b></p> <p><b>Audit 2:</b></p> <ul style="list-style-type: none"> <li>Provide an update on work to collect the required information and implement any required changes to the strategy</li> </ul> <p>Resulting score: <b>75 Unchanged</b></p> <p><b>Audit 3:</b></p> <ul style="list-style-type: none"> <li>Present an analysis of the (potentially) revised strategy and use the collected information to demonstrate that the strategy will work.</li> </ul> <p>Resulting score: <b>80</b></p>								
6	Summary of action plan								
	Undertake a review of current genetic information and DPIRD polices regarding the production of animals entering the enhanced fishery. Dependent on review outcomes revise current genetic management strategy and demonstrate its ongoing viability.								
	<table border="1"> <thead> <tr> <th>Milestone</th> <th>Action</th> <th>Roles &amp; Responsibilities</th> <th>Outputs</th> </tr> </thead> <tbody> <tr> <td>Audit 1</td> <td>1. Review current genetic information on the enhanced fishery and identify any additional information that would improve</td> <td>1. DPIRD and RFA 2. DPIRD</td> <td>1. Review of current genetic information and management strategy to develop a work plan.</td> </tr> </tbody> </table>	Milestone	Action	Roles & Responsibilities	Outputs	Audit 1	1. Review current genetic information on the enhanced fishery and identify any additional information that would improve	1. DPIRD and RFA 2. DPIRD	1. Review of current genetic information and management strategy to develop a work plan.
Milestone	Action	Roles & Responsibilities	Outputs						
Audit 1	1. Review current genetic information on the enhanced fishery and identify any additional information that would improve	1. DPIRD and RFA 2. DPIRD	1. Review of current genetic information and management strategy to develop a work plan.						

	<p>understanding on the effectiveness of the genetic management strategy (e.g., spawning contribution, genetic variability between populations).</p> <p>2. Review genetic components of DPIRD policies that govern the production of animals entering the enhanced fishery.</p>		<p>2. Report on current DPIRD policies regarding genetic management of the enhanced fishery.</p>
Audit 2	<p>1. Undertake data collection and analysis of genetic information identified in the work plan from Audit 1 that's required to improve understanding on the effectiveness of the genetic management strategy.</p> <p>2. Revise genetic components of DPIRD policies if shortcomings are identified during review.</p>	<p>1. DPIRD and RFA</p> <p>2. DPIRD</p>	<p>1. Interim results of work plan including additional data sources and analysis of genetic information.</p> <p>2. Draft genetic sections of DPIRD polices – if required.</p>
Audit 3	<p>1. Revise genetic management strategy and demonstrate the effectiveness of the strategy to maintain the genetic structure of the population.</p> <p>2. Finalise genetic components of DPIRD policies.</p>	<p>1. DPIRD and RFA</p> <p>2. DPIRD</p>	<p>1. Report on genetic analysis undertaken in the work plan that demonstrates the effectiveness of the revised genetic management strategy.</p> <p>2. Publish revised DPIRD polices – if required.</p>

**Table 22 - PI 2.4.2**

1	Condition number
	3
2	Performance Indicator(s)
	2.4.2 (Habitats Management Strategy)
3	Score

	75		
4	Condition(s)		
	By the third annual surveillance audit provide quantitative evidence that the UoA and associated enhancement activities comply with both its management requirements and with protection measures afforded to VMEs (seagrass).		
5	Milestone(s)		
	<p><b>Year 1 (2023)</b></p> <ul style="list-style-type: none"> <li>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be collected and provided to the CAB. Resulting score: <b>75 not changed.</b></li> </ul> <p><b>Year 2 (2024)</b></p> <ul style="list-style-type: none"> <li>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be collected and provided to the CAB. Resulting score: <b>75.</b></li> </ul> <p><b>Year 3 (2025)</b></p> <ul style="list-style-type: none"> <li>Quantitative information on the enhanced fisheries compliance with management requirements to protect VMEs (like seagrass) will be analysed and provided to the CAB to show that all aspects of the MEMP that relate to protection of VMEs have been implemented. Resulting score: <b>80.</b></li> </ul>		
6	Summary of action plan		
	Develop and undertake a spatial habitat mapping program to provide quantitate evidence that artificial grow out structures are not adversely impacting VMEs and that RFA complies with relevant management requirements to protect VMEs.		
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	<ol style="list-style-type: none"> <li>Identify and review the Client's responsibilities with regards to VMEs in relation to the MEMP as well as other relevant protection measures.</li> <li>Develop a spatial habitat mapping program to provide appropriate quantitative evidence that artificial grow out structures are not adversely impacting VMEs.</li> </ol>	<ol style="list-style-type: none"> <li>RFA and DPIRD</li> <li>RFA</li> </ol>	<ol style="list-style-type: none"> <li>Identification of responsibilities of the Client around protection of VMEs.</li> <li>Present design proposal for Habitat Mapping Program including any preliminary data generated.</li> </ol>
Year 2	Undertake spatial habitat mapping program to provide appropriate quantitate evidence that artificial grow out structures are	RFA	Presentation of progress results from the spatial habitat mapping program.

	not adversely impacting VMEs.		
Year 3	<p>1. Finalise spatial habitat mapping program that provides appropriate quantitative evidence that artificial grow out structures are not adversely impacting VMEs.</p> <p>2. MEMP revised to utilise reporting from the spatial habitat mapping program with regards to the protection of VMEs.</p>	<p>1. RFA</p> <p>2. RFA and DPIRD</p>	<p>1. Report on the results from the spatial habitat mapping program. Report on RFA's compliance with relevant management requirements.</p> <p>2. If required, update RFA MEMP with any additional reporting or compliance requirements to protect VMEs. Requirements to be determined from year 1 scoping activity and through the spatial habitat mapping program.</p>

**Table 23 - PI 2.4.3**

1	Condition number
	4
2	Performance Indicator(s)
	2.4.3 (Habitats Information)
3	Score
	75
4	Condition(s)
	By the third surveillance audit provide evidence to the CAB that adequate information continues to be collected to detect any increase in risk to the main habitats.
5	Milestone(s)
	<p><b>Year 1 (2023)</b></p> <ul style="list-style-type: none"> <li>Set up a habitat monitoring program that is ongoing and includes the main habitats and any potential VMEs (like seagrass) and provided to the CAB.</li> </ul> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <ul style="list-style-type: none"> <li>Collect information on the distribution of main habitats including VMEs (like seagrass) and provided to the CAB.</li> </ul> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p>

	<ul style="list-style-type: none"> <li>Collect information on the distribution of main habitats including VMEs (like seagrass) analyse and provided to the CAB to show that the program is ongoing.</li> </ul> <p>Resulting score: <b>80</b>.</p>		
6	Summary of action plan		
	RFA will collect adequate information to detect any increase in risk to the main habitats, especially Vulnerable Marine Ecosystems (VMEs) as defined by the MSC Standard V2.01 (GSA3.13.3.2). Such an approach will be conducted by developing and undertaking a spatial habitat mapping program to provide quantitate evidence of the changes in the distribution of commonly encountered habitats within the lease.		
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	Develop a spatial habitat mapping program to provide appropriate quantitative evidence that artificial grow out structures are not adversely impacting VMEs.	RFA	Present design proposal for Habitat Mapping Program including any preliminary data generated.
Year 2	Undertake spatial habitat mapping program to provide appropriate quantitative evidence that artificial grow out structures are not adversely impacting VMEs.	RFA	Presentation of progress results from the spatial habitat mapping program.
Year 3	Finalise spatial habitat mapping program that provides appropriate quantitative evidence that artificial grow out structures are not adversely impacting VMEs.  Determine the requirement, scope and periodicity for any ongoing habitat monitoring programs.	RFA	Report on the results from the spatial habitat mapping program.  Report on RFA's compliance with relevant management requirements and requirements for any ongoing works.

**Table 24 - PI 2.5.2**

1	Condition number
	5
2	Performance Indicator(s)

	2.5.2 (Ecosystem Management)		
3	Score		
	75		
4	Condition(s)		
	By the fourth surveillance audit provide evidence of a tested and evaluated artificial production strategy with sufficient monitoring in place of all aspects of the production, including hatchery, to reasonably ensure with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.		
5	Milestone(s)		
	<p><b>Year 1 (2023)</b></p> <ul style="list-style-type: none"> <li>Develop an artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery and provided to the CAB.</li> </ul> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <ul style="list-style-type: none"> <li>Finalise the development of an artificial production strategy and demonstrate that it has sufficient monitoring in place of all aspects of the production, including hatchery and provided to the CAB.</li> </ul> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p> <ul style="list-style-type: none"> <li>Provide the artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery and demonstrate that has been tested and evaluated and provided to the CAB.</li> </ul> <p>Resulting score: <b>75.</b></p> <p><b>Year 4 (2026)</b></p> <ul style="list-style-type: none"> <li>Demonstrate that the artificial production strategy that has sufficient monitoring in place of all aspects of the production, including hatchery, that has been tested and evaluated will with high likelihood that the strategy is effective in achieving the Ecosystem Outcome 80 level of performance.</li> </ul>		
6	Summary of action plan		
	RFA will undertake revision of the MEMP to include all aspects of production, with an adequate monitoring program in place. Particular attention will be given to integrating the hatchery component and the genetic management strategy. From this, RFA will be able to provide records of hatchery production and to demonstrate WAEGAF's effective effort in maintaining genetic diversity.		
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	Review current production strategy and monitoring requirements to identify information gaps for draft artificial production strategy (e.g., hatchery component and genetic management).	RFA	Draft artificial production strategy.

Year 2	Develop a Monitoring & Evaluation (ME) protocol for the draft artificial production strategy.	RFA	Draft ME protocol that's included in the draft artificial production strategy.
Year 3	<p>1. Develop a genetic management strategy to maintain genetic diversity (aligned with Condition 2 timelines).</p> <p>2. Review the MEMP to include hatchery operations, the genetic management strategy and ME protocol.</p>	<p>1. DPIRD and RFA – genetic management strategy as detailed in Audit 3 for Condition 2.</p> <p>2. RFA - review and amend the MEMP. DPIRD - approval process for MEMP amendments.</p>	<p>1. Finalised artificial production strategy including genetic management strategy.</p> <p>2. Reviewed MEMP.</p>
Year 4	<p>1. Submit evidence to demonstrate the implementation of the artificial production strategy, including monitoring &amp; evaluation protocol.</p> <p>2. Submit evidence demonstrating appropriate level of reporting and review of reporting.</p>	<p>1. RFA</p> <p>2. RFA and DPIRD</p>	<p>1. Provide evidence of implementation of the artificial production strategy including genetic management strategy.</p> <p>2. Demonstration that the relevant requirements of the artificial production strategy and MEMP are appropriately reported and reviewed. Provide the CAB with evidence of compliance with requirements of MEMP.</p>

**Table 25 - PI 2.5.3**

1	Condition number
	6
2	Performance Indicator(s)
	2.5.3 (Ecosystem Information)
3	Score
	75
4	Condition(s)
	By the fourth annual surveillance audit provide information of the main impacts of the UoA and associated enhancement activities specifically that is considered adequate and continues to be collected to detect any increase in risk level.

5	Milestone(s)
	<p><b>Year 1 (2023)</b></p> <ul style="list-style-type: none"> <li>Develop a monitoring program on relevant ecosystem components and provided to the CAB.</li> </ul> <p>Resulting score: <b>75 not changed.</b></p> <p><b>Year 2 (2024)</b></p> <ul style="list-style-type: none"> <li>Finalise the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred or included additional component of necessary and provided to the CAB.</li> </ul> <p>Resulting score: <b>75.</b></p> <p><b>Year 3 (2025)</b></p> <ul style="list-style-type: none"> <li>Demonstrate that the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred and provided to the CAB.</li> </ul> <p>Resulting score: <b>75.</b></p> <p><b>Year 4 (2026)</b></p> <ul style="list-style-type: none"> <li>Demonstrate that the monitoring program on relevant ecosystem components that has sufficient information to allow some of the main consequences for the ecosystem to be inferred continues to be collected.</li> </ul> <p>Resulting score: <b>80.</b></p>

6	Summary of action plan
	RFA will provide adequate information relevant to the ecosystem by gathering evidence in the literature on drifting algae composition and biomass, and routinely recording predators removed by divers from the lease.

Milestone	Action	Roles & Responsibilities	Outputs
Year 1	<ol style="list-style-type: none"> <li>Review literature for current information relevant to ecosystem interactions of WAEAF (e.g., density dependence, food availability and composition, predator removal).</li> <li>Develop a monitoring program that can provide appropriate quantitative evidence of WAEAF interaction with the broader ecosystems (as identified in Literature Review) and the change over time.</li> <li>Implement processes for recording and reporting predator removal activity.</li> </ol>	RFA	<ol style="list-style-type: none"> <li>Literature review on WAEAF ecosystem interactions identifying gaps and any added monitoring requirements.</li> <li>Present design proposal for ecosystem interactions works regarding drift algae trophodynamics.</li> <li>Annual update on predator removal reports.</li> </ol>

Year 2	Implement monitoring program as developed in Year 1 milestone.	RFA	Draft report of preliminary results from the monitoring program.  Annual update on predator removal reports.
Year 3	Implement monitoring program as developed in Year 1 milestone.	RFA	Draft report of preliminary results from the monitoring program.  Annual update on predator removal reports.
Year 4	Implement monitoring program as developed in Year 1 milestone.  Develop final report for monitoring program including review of program to determine ongoing requirements of relevant ecosystem components.	RFA	Final report of monitoring program that demonstrates there is sufficient information to allow some of the main consequences for the ecosystem to be inferred continues to be collected.  Annual update on predator removal reports and review of likely ongoing effects of those removals.

**Table 26 - PI 3.2.1**

1	Condition number
	7
2	Performance Indicator(s)
	3.2.1 (Fishery-Specific Objectives)
3	Score
	70
4	Condition(s)
	By the second surveillance audit, ensure that short term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are explicit (i.e., well defined and measurable) within the fishery and associated enhancement management system.
5	Milestone(s)

	<p><b>Year 1 (2023)</b></p> <ul style="list-style-type: none"> <li>Short- term objectives consistent with achieving Principles 1 and 2 outcomes have been drafted.</li> </ul> <p>Resulting score: <b>70</b>.</p> <p><b>Year 2 (2024)</b></p> <ul style="list-style-type: none"> <li>DPIRD and the client have finalised short -term objectives designed to achieve Principle 1 and 2 outcomes and these are explicit in the management system.</li> </ul> <p>Resulting score: <b>80</b>.</p>		
6	Summary of action plan		
	Explicit short-term objectives will be developed and implemented within relevant management documentation. These will include annual reporting on broodstock harvest, biomass surveys and ongoing monitoring of VMEs.		
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	Develop short-term objectives consistent with achieving Principle 1 and 2 outcomes (e.g., broodstock harvest, biomass surveys, VME monitoring).	DPIRD	Draft short-term objectives and summary of consultation with client.
Year 2	Finalise and implement explicit short-term objectives designed to achieve Principle 1 and 2 outcomes. Ensure these are explicit in the management system.	DPIRD	Provide evidence that short-term objectives have been developed and implemented. Publish objectives in appropriate management documentation (i.e., via variation to the licence conditions, and/or changes to the MEMP).

**Table 27 - PI 3.2.2**

1	Condition number
	8
2	Performance Indicator(s)
	3.2.2 (Decision-making processes)
3	Score
	75
4	Condition(s)

	By the third surveillance audit, ensure that decision making processes respond to important issues including annual MEMP reporting and take account of the wider implications of decisions such as the broodstock exemption. Information on the fishery performance and management action should be made available if requested.		
5	Milestone(s)		
	<p><b>Year 1</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that annual MEMP reporting is being complied with in order to make responsive decisions to any serious and important issues that are identified. Demonstrate that the impact of the broodstock exemption has been considered in line with the current status of the resource.</li> </ul> <p>Resulting score: <b>75</b></p> <p><b>Year 2</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that the issue of predator removal relating to P2 issues and compliance has been considered.</li> </ul> <p>Resulting score: <b>75</b></p> <p><b>Year 3</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that information on the fishery’s performance and management action (e.g. in line with MEMP requirements) is available on request including explanation of management actions or lack thereof.</li> </ul> <p>Resulting score: <b>85</b></p>		
6	Summary of action plan		
	Streamlined processes involving Compliance, Aquatic Resource Management and Aquatic Science and Assessment will be developed to ensure requirements such as annual MEMP reporting are compiled with, resource level consultation is undertaken, and appropriate records are maintained and can be provided on request.		
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	<ol style="list-style-type: none"> <li>Develop a MEMP Reporting template and ensure a documented process is in place to deal with follow up and non-compliance.</li> <li>Consultation at a resource level within DPIRD regarding any changes to the licence conditions or applications for broodstock exemptions.</li> </ol>	DPIRD	<ol style="list-style-type: none"> <li>Provide MEMP Reporting template.</li> <li>Demonstrate that annual MEMP reporting is being compiled with and that the impact of any broodstock exemptions has been considered in line with the current status of the resource</li> </ol>
Year 2	Develop a strategy to address predator removal including ensuring records are kept and provided to DPIRD.	DPIRD	Provide strategy that addresses predator removal ecosystem impact and reporting requirements.
Year 3	Compile a package of the above outputs to demonstrate the decision-making process	DPIRD	Provide this package to the CAB to demonstrate that information on the fishery’s performance

	that is in place to respond to important issues.		and management action will be readily available and will include explanation of management actions or lack thereof.
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**Table 28 – PI 3.2.3**

1	Condition number		
	9		
2	Performance Indicator(s)		
	3.2.3 (Compliance and Enforcement)		
3	Score		
	70		
4	Condition(s)		
	By the second surveillance audit, provide evidence that sanctions are consistently applied and that fishers comply and provide required information of importance to effectively manage the fishery, including annual MEMP reports.		
5	Milestone(s)		
	<p><b>Year 1</b></p> <ul style="list-style-type: none"> <li>Provide evidence that sanctions are consistently applied and that fishers provide required information such as MEMP reports.</li> </ul> <p>Resulting score: <b>70</b></p> <p><b>Year 2</b></p> <ul style="list-style-type: none"> <li>Provide evidence that the sanctions are thought to provide effective deterrence and that fishers comply with the management system (including all MEMP requirements).</li> </ul> <p>Resulting score: <b>80</b></p>		
6	Summary of action plan		
	DPIRD to demonstrate sanctions are consistently applied and requirements such as annual MEMP Reporting are compiled with.		
	Milestone	Action	Roles & Responsibilities
	Year 1	Develop a MEMP Reporting template and ensure a documented process is in place to deal with follow up and non-compliance (linked to milestones for Condition 8).	DPIRD
			<p>1. Provide MEMP Reporting template.</p> <p>2. Provide documented evidence of sanctions and their consistent application. Demonstrate the Client provides the required</p>

			information as defined by the management system (e.g., MEMP Reports).
Year 2	Review sanctions and demonstrate Compliance's audits associated with licence and MEMP conditions.	DPIRD	<p>1. Compliance report indicating level of Clients compliance with licence and MEMP conditions.</p> <p>2. Provide evidence that sanctions are an effective deterrence and that all elements of the management system are being complied with.</p>

**Table 29 - PI 3.2.4**

1	Condition number
	10
2	Performance Indicator(s)
	3.2.4 (Monitoring and Performance Evaluation)
3	Score
	70
4	Condition(s)
	By the third surveillance audit, the fishery and associated enhancement programs must have in place a mechanism to evaluate key parts of the management system.
5	Milestone(s)
	<p><b>Year 1</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that the compliance regime for this fishery (e.g. risk assessment process and operational compliance plan) has been evaluated.</li> </ul> <p>Resulting score: <b>70</b></p> <p><b>Year 2</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that the exemptions relevant to the enhanced fishery activities have been evaluated.</li> </ul> <p>Resulting score: <b>70</b></p> <p><b>Year 3</b></p> <ul style="list-style-type: none"> <li>DPIRD demonstrate that a mechanism is in place and an evaluation of the annual MEMP report against the fishery's long and short term objectives has been completed.</li> </ul> <p>Resulting score: <b>80</b></p>
6	Summary of action plan

Development and implementation of a documented process to ensure reporting and feedback loops that provide information regarding the fishery's performance are established and operating effectively.			
Milestone	Action	Roles & Responsibilities	Outputs
Year 1	Undertake a compliance risk assessment process.	DPIRD	Report on compliance risk assessment.
Year 2	Maintain a list of all current exemptions that relate to the enhanced fishery and evaluate against target stock status, ecosystem, and management frameworks.	DPIRD	Report on current exemptions that relate to the enhanced fishery and include evaluation and consultation undertaken.
Year 3	Utilising MEMP Reporting template (developed in Conditions 8 and 9) to evaluate fishery against objectives (Condition 7) of the management system (i.e., documented process of MEMP Reporting, when these are due, was this compiled with, have short term objectives been adhered to).	DPIRD	Provide finalised MEMP Reporting template and demonstrate how this template links to short and long term objectives developed for the fishery. Implement a review process for the management system (every 5 years).

## 9.2 Surveillance

**Table 30 – Fishery surveillance program**

Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 5	Off-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & re-certification site visit

**Table 31 – Timing of surveillance audit**

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	June 2023	October	To align with the anniversary date of the related WA Abalone Fishery
2	June 2024	October	To align with the anniversary date of the related WA Abalone Fishery
3	June 2025	October	To align with the anniversary date of the related WA Abalone Fishery
4	June 2025	October	To align with the anniversary date of the related WA Abalone Fishery

**Table 32 – Surveillance level justification**

Year	Surveillance activity	Number of auditors	Rationale
1	Off-site audit	2	There are no conditions due to be closed out during the first surveillance audit. progress towards conditions can be provided remotely in year 1

### 9.3 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The CAB shall include in the report all written decisions arising from the Objection Procedure.

Reference(s): MSC Disputes Process v1.0, FCP v2.2 Annex PD Objection Procedure

